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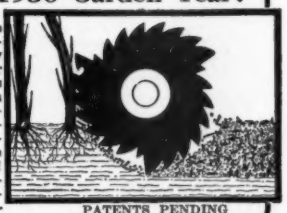

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Organic Gardening

VOL. 16, NO. 6 JUNE 1950

IN THIS ISSUE

Forum		3
Editorial—The New Organic Method	J. I. RODALE	14
Della Devil's Horse—Praying Mantis	JANE GREEN	17
Prolific Primroses	ESTHER T. LATTING	18
Choosing Your Tree	FRED McCREADY	20
With Tails We Win	MARY CROWE	22
Soil and Health Foundation		23
Deficiencies	WILLIAM H. EYSTER, PH.D.	24
Florida's Stricken Waters	H. R. BISSLAND and BILL WEEKS	26
Miscellany	J. I. RODALE	29
Lower Temperature Means Higher Quality for Fresh Vegetables		31
Greenhouse Gardening	ERNEST CHABOT	32
Old and Modern New England Floral Arrangements	ANN ANDREWS	34
Silvery Foliage for the Rock Garden	G. L. WITTROCK	35
Sheet Composting	REYNOLDS A. MORSE	36
Our Native Shadblow	HENRY S. KERNAN	38
I Don't Believe That	LEONARD WICKENDEN	39
Seminar on Green Matter	WILLIAM H. EYSTER, PH.D.	40
Colonial House and Garden		42
Modern Iris	A. F. BLOESE	43
Too Old To Grow	FLORENCE GUNN	45
Indian Compost More Productive Than Chemical Fertilizers		45
Garden Calendar for June	WILLIAM H. EYSTER, PH.D.	46
Grow Tomatoes	WILLIAM ACKERMAN	48
Two Year's Observation of Organic Gardening	CATHERINE W. SCUDDER	50
Hints for the Flower Garden		51
Hints for the Vegetable Garden		52
Readers' Correspondence		60

COVER DESIGN

The Iris Garden shown on the Cover belongs to Mr. Stedman Buttrick of Concord, Massachusetts, Treasurer of the Massachusetts Horticultural Society. Associated with the Iris are Columbine, Lily, and Peony, all in harmony with the red bricks and green foliage in the background.

—Kodachrome by Genereux

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THE FORUM

Catch Moles With Meat-Baited Mouse Traps

Thank you very much for publishing on page 7 of the December '49 issue our letter about catching ground moles by using fresh-meat-baited mouse traps. We have received numerous inquiries from fellow-readers, asking for clarification of some points on the manner of setting the traps. Perhaps a "follow-up" would be of help to the probably many other puzzled readers who, even as we, want to write but never get around to doing so! We enjoy so much the friendly, generous fellowship encountered among Organic Gardeners, personally and by mail, that we don't want to deter any of them from writing to us,—but we are also anxious to help, especially now that the gardening season is here!

As our previous letter stated, we were quite successful in catching ground moles by baiting ordinary flat mouse traps with fresh raw meat. The trap is set *on the ground* (not in the runway) *just at the round openings to the surface* which the moles have made. By examining the runways, such openings, which are about as big as a silver dollar, can be found here and there. If in doubt whether such an opening is still in use,—fill it in with a little loose dirt, and then observe the place frequently for a few hours or a day or so. If this is a busy, currently used runway, the hole will soon be reopened by the moles! Then, leave the hole and runway alone, and just set the flat fresh raw-meat-baited mouse trap on the ground as close to the hole as possible,—being careful that the trap *can swing freely to snap when disturbed.* A few of the moles were

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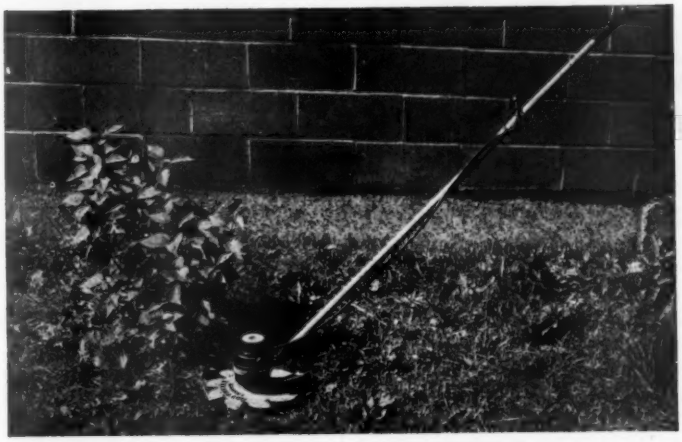

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caught by the head, but most of them were just barely caught by the snout, indicating to us that moles are extremely quick to withdraw from danger. But the scent of the desired meat lures them quickly to these natural openings, and they are caught if the trap can spring instantly.

Even as some of our correspondents did, we hoped to catch more moles by making more openings in the runways, similar to the "natural" ones, and setting traps there. But moles apparently are also very suspicious of any disturbances to their tunnels, and not a single mole was caught that way. Neither can traps be set into the runways; either they cannot swing freely, or this disturbance scares the moles away.

We had hoped that our mole troubles were solved. But alas, by the time my letter appeared, and inquiries started coming, my dear husband was especially chagrined to find our lawn more riddled with runways than ever before!—and he was acutely embarrassed that I had perhaps "spoken out of turn." Judging by the letters, similar infestations are rampant from Florida to Michigan to Illinois, however,—so probably this is a "very good mole year"! During this comparatively mild winter here, our grounds bear many evidences of "moles at work," yet the fresh meat in the traps freezes or is cold enough to lose its scent, and we shall have to wait for warmer Spring days to continue our "trapping." But trap we shall, since that is the *only* method which has given us any degree of success at all. We intensely dislike destroying these little creatures, but they do disturb lawns and gardens when they invade a property. We hope that eventually our soil will be productive enough, (by means of our domesticated earthworms, "Crawford's Crawlers," and other purely Organic methods), that it will support vegetables, trees, lawn, flowers, worms, and if necessary, moles, too. But until then, we shall continue setting the fresh raw-meat-baited mouse traps right on the

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ground at the openings in the runways the moles themselves provide.

Thank you for passing these "pointers" along, if you deem it worth while. And thank you, too, for the splendid bigger and better *Organic Gardening Magazine.*

Mrs. J. Delmar Crawford,
25 Crowe Ave., Mars, Pa.

—o—

New Composting Methods Must Be Simplified

I read with greatest interest "How to Apply the New Organic Method in the Garden." I was especially interested in Dr. N. R. Dhar's letter of June 24th. Mr. Palmer, my former supervisor in the Los Angeles schools, talked over the matter with me and we both came to the conclusion that we had been doing the same thing in sheet composting for a great many years without scientific flourishes and publicizing. I am of the opinion that until we simplify the method of enriching the soil by organic methods the average farmer is not going to pay much attention to what we say. Later on I will write you at length a very interesting experiment I tried on an old run down estate. The one hour "stirs" advocated by the Bio-Dynamic System set me to wondering whether all that agitation was necessary. I got good results with Sir Albert Howard's composting methods but my workers objected to too much "turning." Most people like Miss Maye Bruce's Quick Method. No "turning," with or without animal manures, and in addition a covered bin. I have never liked an open compost pile. I use a sheet iron cover on mine. A concrete bin may be all right but in this country where we have the everlasting Redwood lumber cheap, a wooden bin is easy to construct and economical to operate.

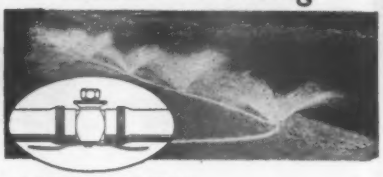
Charlotte M. Hoak,
1125 Stratford Ave.,
South Pasadena, Calif.

—o—

Do Earthworms Become Dormant in Winter?

I do not believe that earthworms hibernate or lie dormant at *any*

scientific watering!



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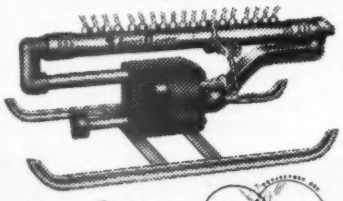

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time of the year, *except* that one can find worms at any season in an apparently dormant or semi-dormant state, having woven themselves into a ball. Always they occur singly and always in apparently the same pattern. I have found them so in every month of the year and always with normal and lively worms all about them. These are not "babies" but of normal length, though very thin and empty looking and a pale pink in color. I have broken through frozen earth on innumerable occasions and found worms right up against the frost, (but never in it).

This winter we have had zero weather twice and plus 10 or 15 quite a lot, but I continue to make compost with whatever is available. Right now it is last year's hay dumped on the ground to weather and year before last's baled straw that has laid out all this time and is fairly rotten. This material is wet and frozen and takes a lot of beating and pounding to get in shape, but in any part of these bales that is not frozen I find life: Earthworms, white grubs of June bugs, two kinds of millipedes, sow bugs and smaller insects that I cannot name.

At another time I helped to move a house trailer in winter. The temperature was 4 below. It was jacked up and setting on blocks. After we removed the trailer it was necessary to use a sledge to loosen blocks from the frozen ground and right up against the bottom of these blocks were earthworms sufficiently active to disappear before they froze.

Can you tell me anything about this "dormant" stage of worms?

W. F. Lawhead,
Cardington, Ohio

Editor's Note—Earthworms seem to share with other species belonging to the *Anneleda* the tendency to form, under certain conditions, an encystment about themselves. So far as I know, the significance of this "encystment" of the earthworm is not understood at the present time. It is not a dormant stage in the sense that dormancy means spending the winter in an inactive state.

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Stone Mulching in Rhodesia

The enclosed photograph may appeal to you as an example of stone mulching in Rhodesia. The little

girl in the picture is my granddaughter.

J. M. Moubray, Chipoli,
Shamva, Southern Rhodesia.

—o—

Hens Help Make Compost

I have discovered a shortcut to fine compost that really works. All summer I put all my compost material—mostly weeds—in the hen house. It is best to dry the weeds first, except what you want the hens to eat. They eat some and work the rest over, mixing it well with their straw litter and manure. In the fall there is an extra lot of dry weeds. I rake them up from the edges of fields, road sides, etc., and throw them in. I clean my hen house only once a year (this, by the way, is recommended by many poultry men, and there is absolutely no bad odor). I did this the first of November, making a heap 6x8x5 feet, adding only ground limestone and a sprinkling of soil occasionally, as the vegetable matter was already in it. It was all dry and powdery, thanks to the ceaseless activity of my 100 Austra Whites. I give it a good wetting as I pile it. When I turned it at Thanksgiving, all except the outer

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edges was black as coal, almost completely composted. I have it piled again now, with boards on all sides except the south and covered with litter.

Olive Hathaway,
1501 W. Kiowa St.,
Colorado Springs, Colo.

—o—

Earthworms for Garbage Disposal

For the past ten months I have been disposing of my garbage by digging a trench in my worm bed and burying it to a depth of about six inches and the worms take care of the rest of the job.

I have a wooden bottom in the bucket in which I put the garbage, and an old hoe that I straightened out to use as a scraper is used to chop the garbage up. I use the same outfit for chopping up leaves and other materials which I wish to use in the worm beds. I add a little Activo in the garbage bucket to keep the odor down and empty the bucket whenever it gets about two-thirds full.

In from four to six days after the garbage has been buried I find that the worms are working in it in unbelievable numbers. It would seem that all of the worms in the pit have collected together to dispose of the material and turn it into compost. This method of disposal might be termed land fill, on a small scale.

The worm pit is covered with a movable cover hinged down the center, in order to control the moisture.

Ralph W. Poe,
Canton, Illinois

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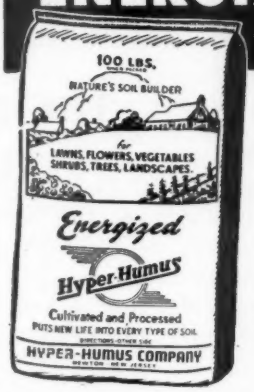

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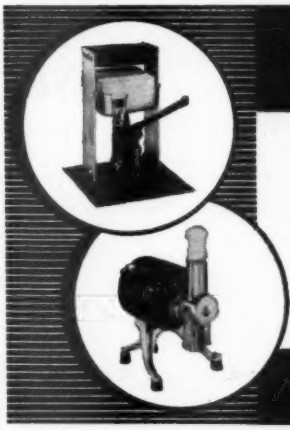

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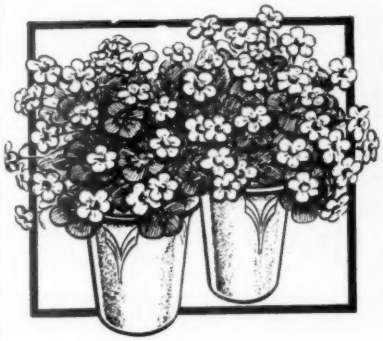

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Friend Sykes' account begins when what was regarded as one of the best herds in England proved, upon government inspection, to be 66% diseased—the result of deficiencies in the food plants. The herd was dispersed and the valuable farm land sold. Friend Sykes then purchased 750 acres of land on the Salisbury Plain which farmers round about considered practically worthless. He subsoiled it and fertilized with natural manures exclusively. Pasture and crop plants were grown which were rich in minerals and other nutrient materials.

As a result, the cattle and horses were maintained in health and vigor that had been hitherto unknown, and the land is now visited by outstanding agriculturists as one of the most interesting farms in England. 416 pages, 40 photos. **$4.50**

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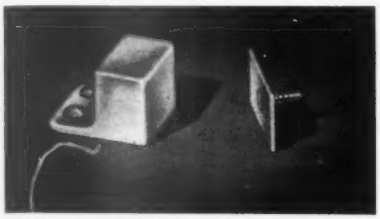

snap-type fixings. The Leco-Latch isn't complicated; a complete unit consists of a small but powerful permanent magnet, a small plate made of special steel, and necessary screws.

By attaching the magnet to the inside of your cupboard and the plate to the door, the door is held closed by magnetic force. More information on this device may be obtained by writing to Laboratory Equipment Corporation, St. Joseph, Michigan.

Individual Plastic Hot House

An exceptionally successful new plastic cap for germinating early seeds and seedlings, known by the trade name "Hotouse", has been re-

leased. The type used for home gardeners and truck farmers is 5" wide by 8" long and 5" high. A test of 500 "Hotouse" caps made by a fruit grower resulted in a 100% yield; not a plant was lost! When used for melons, tomatoes, strawberries, or cabbage—crops can be marketed ahead of the general supply.

These caps are easily placed, they retain moisture within their shell, and permit the full benefits of the sun. It is possible to inspect plants without lifting the cap. They are heavy enough to withstand a strong wind. Martin Roberts Co., 838 Symes Bldg., Denver, Colorado.

Scare-Away

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Aluminum strips, ten inches long and two inches wide, called Scare-Away were introduced to gardeners last year. They do away with the necessity of using chemical repellents for birds, rabbits and other garden pests. Recent research and testing proved that this is an effective method of protecting seed in early stages of planting.

Garden pests are frightened by the light reflection, the crackling noise and the jangling movement of the aluminum strips. The slightest air

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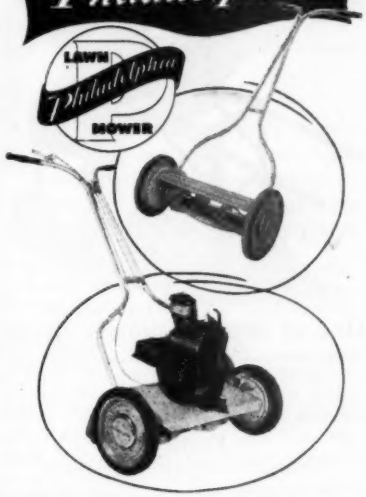

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circulation increases the effectiveness of the strips. They are hung by a short piece of string from branches or from a line stretched across the area to be protected. Scare-Away are being produced by the Portco Corporation and distributed to garden stores nationwide this year. Ten aluminum strips in a package are sold for $.25.

Cast Iron Hitching Post

A Cast Iron Hitching Post painted in a dull black over a prime coat has just been released for consumer purchase.

This Hitching Post is a replica of an antique model from which the patterns were made and carries out the old style idea of a Hitching Post to be mounted on a wood fence post

of either round or square material. Can be a garden ornamentation or actual Hitching Post for private or public stables.

To be sold through the department stores, hardware stores, lumber dealers, nurseries and landscape

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The New Organic Method

BY J. I. RODALE

HERE WE are again for the seventh round in the discussion of the revolution of the organic method. For the convenience of new readers let me say that up to December, 1949, the organic method consisted mainly of two things—*one,* using compost made by the Sir Albert Howard method, which is described in our booklet *Compost and How to Make It,* and *two,* sheet composting, which means not making a compost heap, but applying the organic matter as a thin layer or sheet in the field and letting it compost there for a few months and then digging or plowing it in. Sir Albert Howard often advised this latter procedure.

In the summer of 1949 we had the good fortune to employ Mr. Selvi, a former Italian Government agriculturist, in our laboratory, and as a result, certain observations which I began to make seemed to appear in a different light than before, I came to the conclusion that there were certain disadvantages with the old method of making compost and that improvement was in order. Practically everything man is concerned with undergoes change gradually, not always for the best, but change is human. Evolution keeps rolling on. Even the human body as an organism is slowly changing, based on the habits of man. For example, it is said that due to man's diet today consisting of so much soft, mushy food, in a few thousand years children will be born without teeth. Man will become a toothless creature. That will be an exceedingly slow change. Our appendix was once a useful organ, but over time it has gradually lost its function, whatever it was.

Naturally in the making of compost we must not sit by passively and contentedly, year after year, decade after decade, century after century, and continue a process, in blind devotion to a great man, even though that great man, were he alive would be the first one to advocate continued change and improvement. I had enough contact with Sir Albert Howard to know what his attitude would be.

Once, I *did* make a change, while he was alive. I decided that turning the compost heap twice as he advocated was too laborious and suggested the use of earthworms for that purpose. You should have seen the glowing letters Sir Albert wrote me about it, in which he said "bravo" in no uncertain terms. Sir Albert Howard had only one sworn purpose in life and that was, to help his fellow man, without regard to his own interests. He never cared for money.

Now, what was the change I suggested in December, 1949? I saw two weaknesses in the making of compost by the old method. One—permitting unlimited air to get into the heap produces a powerful oxidation which destroys much nutriment of the organic matter, including nitrogen, phosphorus and potash, plus other organic substances. However, little scientific work is available to tell us what *is* destroyed. Secondly, serious amounts of liquids, containing valuable nutriments, leach from below especially in rainy weather. I have seen on our farm in such weather large amounts of brown waters seeping out from the bottom of our pits through cracks in the mortar of the foundations.

Enzymes

In connection with the subject of oxidation from above we must not overlook that of enzymes. I am sure that large quantities of enzymes, which are so important as aids in the biologic and chemical processes of all life, are oxidized out of the mass from above. With a heat of 150 to 160 degrees Fahrenheit, many of the enzymes are no doubt inactivated.

It has been taught that this high heat kills off disease organisms, so that one can safely place diseased plants in the heap, as they would be rendered harmless. We know of many cases where such affected green matter was composted and did not transmit the disease to the crops in which such compost was used. But the question is, was it the high heat of the composting process that did it, or some other factor? Dr. Selman A. Waksman of the New Jersey Agricultural Experiment Station in his book *Humus,* says that the mere presence of organic matter is sufficient to depress the action of disease organisms. Something in the organic matter has that power—whether it is some anti-biotic organisms, or something as yet unknown cannot

be said with certainty. If you have plenty of organic matter in the soil under proper conditions of decay and observe the necessary period of waiting before planting on raw matter, one need not fear disease.

The Italian enclosed method which I now advocate cannot be called an anaerobic method. It is only partly anaerobic, just as at the bottom of a Sir Albert Howard heap the conditions are anaerobic, although the air holes advocated help along to introduce some air. The main purpose of making the compost in an enclosure of some kind with a covered top is to keep the carbon dioxide, which is given off by the decaying organic matter, in the mass so that it becomes the equivalent of the air in the soil, an air charged with carbon dioxide which for several reasons seems to be highly desirable. In other words the Italian enclosed method tries to duplicate the condition found in the soil, thus sticking close to nature. In nature when organic matter is being decomposed you do not find it done by a high heat decomposition. No. It is always a cold decay. That is extremely important and cannot be overlooked. A hot oxidation destroys too much of the material.

Selvi, as described in the December, 1949, issue of *Organic Gardening*, found that manure kept in efficient conditions in an open pit loses 40% of the nitrogen originally contained, not to mention the losses of phosphorus and potassium, whereas in enclosed pits it loses only 10% and sometimes even as little as only 2%. In merely piling manure in the open, without benefit even of an open pit, the loss of nitrogen may be as high as 80 to 90%.

Experimental Evidence

In connection with nitrogen losses by the aerobic method of fermenting manure Selvi says, "In this connection, it is necessary to consider the results of the very important experiments that were carried out many decades ago by the famous chemist Dehèrain. In one case of imperfectly anaerobic (i.e., not in contact with air) fermentation of manure he found a loss of 19.2% of the original nitrogen; in aerobic (i.e., in contact with air) fermentation this loss came out about double, 38.2%. But perfect anaerobic fermentation *showed no nitrogen losses whatsoever.*"

There exists a great deal of confusion regarding the terms fermentation and putrefaction. In the popular conception, putrefaction means an anaerobic condition, or lack of air. This is not always true. While putrefaction usually is not aerobic, neither is it always anaerobic. In the Webster's New International Dictionary unabridged the definition of *putrefaction* is given as follows:

"The decomposition of organic matter especially the typically anaerobic process of splitting of proteins, by the agency of bacteria and fungi, with the formation of foul-smelling, incompletely oxidized products, as mercaptans and alkaloids."

Before we discuss this definition let me reiterate that we recommended that only fresh manure be composted by the Selvi process. In his booklet which we published in the December, 1949, issue, only cattle manure was discussed. To use plant matter in this enclosed process would be extremely difficult and would require a great deal of experimentation. From an experiment that I have already made I know it would entail extremely fine grinding of the plant matter and that it would require liberal inoculation of the mass with old finished compost made by this method, but that is in the future. Now we are concerned only with the question of composting manure.

The definition above shows that in the putrefaction process, mercaptans and alkaloids are given off. Mercaptans are compounds that contain sulphur in place of oxygen, and in which there is an exchange of hydrogen for mercury. There is little sulphur in the average animal manure, and no mercury that I know of. In our experiments there was no production of mercaptans or putrefactive odors. In swamps sometimes there exists anaerobic decay and there is found there a characteristic odor of rotten eggs which is caused by the presence of liberal amounts of sulphur. Under certain conditions of anaerobic composting, where the manure is very solid and contains much liquid, like chicken manure, I would hesitate to use the Selvi method. In such case the best method is to dig it into a soil on land where a crop will not grow for three or four months (not freezing weather). In a temperate climate if it is dug in in September or October and left until about May 15 when a crop like corn is planted, there will not be any danger from the effects of the rawness of the manure. In the Selvi method there must be a circulation of carbon dioxide in the mass. In solid chicken manure that might be impeded and in such cases I have noted a foul smell as of sewage, which is entirely undesirable.

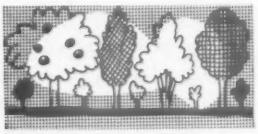
Now as regards the second point of the definition, (the giving off of alkaloids,) alkaloids are organic substances of alkaline properties and usually consist of parts of plants such as morphine, strychnine and cocaine. This is not a problem in ordinary cattle manure which is more on the acid side than on the alkaline, except under unusual and rare conditions.

Putrefaction and Fermentation

So, as far as I have been able to observe, the words *putrefaction* and *anaerobic* are not used correctly by many persons and under various conditions. As time goes on we will attempt to keep this discussion going and perhaps add a little to the knowledge in this field.

One of the points brought out by Selvi was that his method does not reduce the mass so much but that the oxidation of the aerobic method is more of a combustion, a burning, and reduces the weight of the materi-

al seriously. He alludes this partly in his paper when he says: "It is needless to say that the various derived processes or treatments of manure, besides affecting the nitrogen content, also influence directly the contents of the organic substances, decreasing their richness and altering their reaction." Further on he says, "Fresh manure kept in the condition explained (in an open pit) falls to half its volume, and what is more important for our purpose, up to two-thirds of its original



weight. The reduction in volume is mainly due to the gradual condensation, that in weight is principally the result of the processes of active decomposition." In our making of compost in open pits we have sometimes seen the volume of the mass go down to one-third of the original amount. Selvi states that where under aerobic conditions the weight went down by one-third, under the anaerobic conditions it went down by only one-fourth, or an increase of 8% besides a greater saving in nutrients.

Let us see what goes on in a septic tank. All the sewage is finally decomposed entirely and all that comes out in the end process is water (laden with minerals) but the popular conception is that in a septic tank the process from beginning to end is anaerobic, and that it is this exclusion of air that breaks down all the organic matter. This is not so. The final phase of a septic tank is aerobic, otherwise the matter would never be completely reduced or combusted. Here we see again the effect of air in causing an excess reduction of organic matter. If it were not for the fact that septic tank water might contain some disease organisms it might well be used as a fertilizer. This aspect is worth checking.

Professor Selman R. Waksman and Florence G. Tenney of the New Jersey Agricultural Experiment Station did some researches comparing the aerobic and anaerobic decomposition of various types of organic matter which was recorded in *Soil Science*, of August, 1930. In it the authors say, "In a study made on the decomposition of immature oak leaves under aerobic and anaerobic conditions, it was shown that when the leaf material was saturated with water, the celluloses and hemicelluloses were decomposed much more slowly than when the material was under aerobic conditions; the fats and waxes were much more resistant to decomposition and the lignins were preserved almost quantitatively, whereas the protein content of anaerobic material was considerably greater than that of the aerobic compost because of the greater decomposition of the proteins and losses of the nitrogen in the form of ammonia in the aerobic compost." This corroborates what Selvi said in his paper.

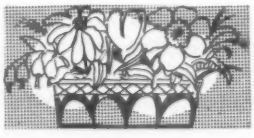
Waksman and Tenney accomplish the same result with corn stalks, rye straw and again oak leaves. They say, "The aerobic decomposition of plant substances shows that after 27 days, 20.19 per cent of the total material was decomposed under anaerobic conditions, whereas 36.46 per cent disappeared in that same period of time in the aerobic experiments," and they stress the fact that this means a loss of organic matter. Then the authors describe the results in aerobic and anaerobic decomposition of alfalfa. Here is what they say about it: "The proteins in the alfalfa underwent an immediate and rapid decomposition under the aerobic conditions; since the amount of nitrogen was greater than that required for synthetic activities by the microörganisms that bring about the decomposition of the celluloses and the hemicelluloses, a large part of the nitrogen was liberated as ammonia and lost in the atmosphere. Under the anaerobic conditions, however, the nitrogen was largely preserved and only after 135 days of decomposition were any losses observed."

In spite of these experiments, I wish to warn that decomposition of plant matter under anaerobic conditions is much more difficult than that of manure and must be approached warily and only after a certain amount of experimentation.

Fletcher's Advice

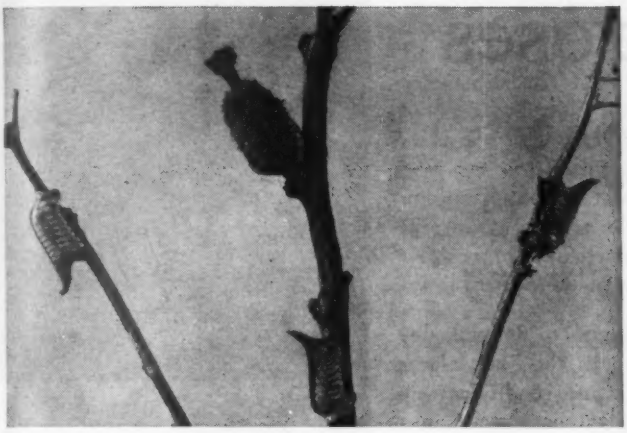
Here is the viewpoint of another scientist, S. W. Fletcher, professor of Horticulture in the Michigan Agricultural College, who in his book *Soils—How to Handle and Improve Them* (1917) said in a section entitled, *How to Prevent Loss by Heating*: "The fermentation that makes manure deteriorate in value takes place only when it is piled loosely, so that air passes through it readily. Compacting the manure, as with the trampling of animals, prevents this loss. Manure must also be only moist, not wet, in order to ferment; so that if it is kept wet with the liquid excrement, there is little likelihood that it will heat. Sometimes it is practicable to wet the manure occasionally. If fermenting manure has a small amount of fresh manure mixed with it the heating will be checked."

Here, Professor Fletcher suggests placing fresh manure with fermenting manure. Mr. Selvi told me that in his researches he experimented a great deal with inoculating the manure with decayed manure from the same pit, because it was teeming with the organisms that thrive under the conditions obtained in the pit. For best results the Selvi process is



a continuous one in a silo-like structure in which the height is four times the width, and in which the material is placed in at the top and taken out of the bottom. The process then never stops and from time to time

(*Continued on page* 53)



Egg masses of Praying Mantis

Della Devil's Horse — Praying Mantis

by JANE GREEN

IF YOU happen to find a case or *nest* of praying mantis' eggs cemented to a limb of a garden shrub, or perhaps on an old plank or dead stick, you would do well to preserve it carefully until hatching time—that is, if you prefer harmless natural means of plant protection as against using strong, and always more or less dangerous sprays. Some gardeners even purchase these eggs and fasten them on dahlia and sweet pea plants particularly, as the mantis dotes on the tiny aphids that ruin your favorite flowers.

Incidentally, these egg cases are a study in themselves with their unvaryingly symmetrical cells, thoroughly air-conditioned so as to protect the eggs from the winter's cold. The eggs first laid are a foamy mass that hardens soon after being exposed to the air, and they are stuck quite securely to some protecting surface.

This queer creature, called rear-horse, praying mantis and devil's horse, is the subject of almost as much superstition here in the south as bats and snakes. It is more generally known among us as devil's horse, and despite its reputation for being poisonous, for having powers of divination, and also for being religiously inclined, it is actually absolutely harmless, obliging as to helping destroy plant and household insects, and, strange as it sounds, easily domesticated. The devil's horse is a true insect, and the only one capable of turning its head from side to side. It has six legs, but uses only four for walking, as the fore-legs are really *arms with teeth* for seizing and tearing its prey. Although it has wings and can fly, it doesn't often use them.

Della, the female in the accompanying photographs, hatched on the front porch along with her many tiny brothers and sisters. At first they were minute black youngsters with protuberant eyes, long grasping fingers and man-

(*Continued on page* 54)

Male left, Female right—Praying Mantis

Female Praying Mantis killing the male after mating with him.

Female Praying Mantis after having killed the male.

Prolific Primroses

GROW PRIMROSES FOR YOUR INDOOR WINTER GARDEN

by ESTHER T. LATTING

Warner, New Hampshire

Primula polyantha

FOR plenteous bloom during the winter months, give me primroses. The variety is a matter of taste. You may have the dainty grace of *malcoides,* the Fairy Primrose, the large, lacy beauty of *grandiflora fimbriata,* the giant fringed primrose, or the in-between *obconica, sinensis, stellata, kewensis, verticullata* or *floribunda.* Some are rather difficult to find but most greenhouses carry the Fairy and Chinese primroses which are fine for a start.

Far better than buying plants, is raising them from seed. They are easy to grow and the price of a packet of seed will be only a quarter that of a grown plant. From one packet, you will be able to fill your windows with winter beauty and have many extra plants to give to flower loving friends. Not only this, but plants grown under home conditions will thrive better than those grown in a greenhouse.

Primula denticulata

Seed should be sown in February or March for plants that will start to bloom in October and November. I find a small flat the size of a cheese box about right to start them. The soil should be a mixture of one-third each of compost, sand, and garden loam. The seedlings do not need a rich soil. Fill the flat level with the sides. Sow the seeds thinly in rows marked off with the edge of a ruler or a pencil. Cover with a little plain sand. The sand helps to prevent the formation of a crust before the seedlings appear and damping-off afterward. A newspaper or damp cloth spread over the flat will help to keep the soil moist before the plants come up. The best temperature is around 60 degrees.

The seedlings will appear in approximately two or three weeks and the cloth or paper should be removed immediately. They need plenty of air. The soil should be kept moist but never allowed to get soggy. When watering is necessary before the seedlings are put outdoors, it is best done by setting the flat in a container of water in the morning when the temperature is rising. The flat should be placed in an east window where it will get a little early morning sun. If only south or west windows are available, put the flat behind a thin curtain or in back of taller plants where the sunlight will be filtered. Unlike a great many house plants, primroses must be kept cool.

When the little plants grow their second pair of leaves, they should be potted in small pots or moved to a larger flat where they may be spaced two inches apart each way. It is easier to handle them in the flat as the small pots are prone to dry out quickly. The soil mixture should consist of one part each of sand and compost and two parts of good loam. The seedlings may be grown here until the plants begin to get crowded when they should be transplanted to 4 inch pots.

The soil in the pots should be half well-rotted compost. They will start to bloom in this sized pot and may be left until December or January when a transfer to 5 or 6 inch pots will be in order. This time mix one teaspoonful of bone meal with each pot full of soil to encourage blooming.

From June through the summer until September, the little plants will flourish outdoors. The ideal situation is under a tree where they will get plenty of light and a little early morning sun, but will be protected from direct sun during the heat of the day. Above all things the plants must not be allowed to dry out. They need cool moist growing conditions and anything that can be done to provide these will prove well worth-while. During particularly hot spells, it may be wise to sprinkle the plants two or three times a day.

By the first of September, the plants should be brought inside. Keep the windows open as much as possible to make the change from outdoor conditions to indoor more gradual.

From about the first of November to about the first of February, de-

Primula polyantha

pending on the latitude, the plants may be grown in south windows but after the increasing heat from the sun is too much for them they should be moved back from the windows or put in east or west windows. They will continue to bloom for a while even in north windows. By shifting the plants from the north to more sunny windows every week, it is possible to keep them in bloom.

For best results, primroses should be grown cool. If your home is hot and dry, it is no place for them. They may be kept in fair condition if you have a cool room where they may spend the night and an occasional week to recuperate. They need plenty of water but the soil should not be soggy. Of course the warmer the room, the more water will be required.

Most varieties can be carried over successfully from year to year although I have found this impossible to do with the Fairy Primrose. For me it acts as an annual and blooms itself to death. The Obconica and Chinese primroses will live over and form multiple crowns. These should be divided every few years to prevent becoming crowded.

The primroses appreciate a summer outdoors and do best in the same shaded situation as the seedlings. Or they may be kept indoors in a north window. Nothing will kill them more promptly than hot sun. They must be placed where they will get no direct sun after ten in the morning. Even late afternoon sun during the summer is too hot. A cool moist condition will make them thrive. Any necessary repotting or dividing is best done in the summer when they are put outdoors. Keep buds picked from them so that all their strength will go into developing a better plant for increased bloom during the ensuing winter.

Aphids are particularly fond of the tender foliage of the Fairy Primrose but may be kept under control by mixing tobacco with the soil. I save butts from ash trays around the house and mix both the ashes and tobacco with my potting soil. An occasional spraying with a strong stream of water will help to keep the foliage clean.

A dozen plants will not only supply you with copious bloom in the windows but will allow enough to pick for the table. The colors range from white through shades of pink, rose, and lavender in *malacoides, sinensis, obconica,* and *stellata* and yellow in *kewensis, verticullata,* and *floribunda.* With the variety of form and color, it is possible to make many charming pictures in the winter windows.

One word of caution is in order, however. Some people are allergic to primroses and will develop an itchy skin. *Obconica* is the worst offender in this respect.

The winter of 1946 I had a number of these plants and found my hands constantly itching. At first it did not occur to me what was causing it but when I realized it must be the primroses, I bought a pair of rubber gloves and my troubles were at an end. Oddly enough, that is the only year they have poisoned me. I still have many of the same plants but I do not find it necessary to wear the gloves any more.

So don't let the possibility of poisoning deter you from growing primroses. If you have room for only one kind, try the Fairy Primrose first. They are the most prolific bloomers of the tribe and one of the loveliest.

Primula veris (officinalis)

American Linden

CHOOSING YOUR TREE

by FRED McCREADY

IT IS easy for any of us to choose a tree that we would like very much on our lawn or along the street. But the question really is: Will the tree choose us? So, before choosing that tree, let us see what we have to offer it. If we live in a suburb or small town where homes are not congested and the trees can breathe easily then one is safe in picking any of the popular shade trees, such as the maple, the linden, and numerous others. Maples cover the eastern seaboard and lindens thrive well through the middle west and into the south. Here we want to first discuss the linden.

But before studying the linden let us look at some of the varied conditions that trees face. People who live in the congested city districts or near dusty cement or steel mills have much less choice in trees than suburbanites. "The Tree That Grows in Brooklyn" from the novel of that name, has always been represented as the ailanthus, or tree of heaven, because this is practically the only tree which grows "wild" in big eastern cities. Maples, planes, lindens, horse chestnuts and other trees need some fresh air and some lawn space to spread their roots. Only the best-transplanted and cared-for maples, lindens, and planes will withstand the city desert of heat, dirt, asphalt, and concrete.

Almost the only other familiar tree in heavy industrial sections is the willow down by some dirty little stream. This tree, too, will survive against "insuperable obstacles." The ashes, locusts and horse chestnuts are three other types of trees which will stand up under moderate drought and the killing soot and dirt which destroys most trees by preventing them from "breathing" through their leaves. A tree-lover in a small Pennsylvania mining community years ago planted black locusts by the thousands and they have thrived and changed the bare, dirty community into a pretty little town. Evergreens planted on the hillsides by the town have covered the scarred countryside. Best of all, the leaves and needles are providing compost to make new soil for vegetables and flowers.

However, in both city and country one usually avoids a number of trees for special reasons. The locust, birch, and poplar are short-lived. In New England, of course, where the white birch is a beautiful addition to the countryside one does not consider its short life and perhaps the same is true of the Lombardy poplar in other sections. But as I look from my window right now I can see a row of poplars, one of which looks quite sickly. Shortly, someone will have a big bill for cutting them down and replacing them. The horse chestnut is another tree that no longer is popular in spite of its dignified appearance, its attractive leaves and its ever-attractive burrs and nuts for the boys. Like the box-elder, it brings too much litter. If

Sugar Maple

you live in the country or have enough room on your property, by all means include the handsome American sugar maple. The elm is equally desirable—particularly if you have a fine view around which a tall elm can arch its branches. An elm that has withstood the storms and droughts of 50 years or more is an encouragement to man to withstand the depressions and wars and griefs of life with his head well up.

Black Locust

White, scarlet, and red or black oak also should be considered along with the linden. Of course, there is the matter of soil to think about. White ash, pin oak, willow, American linden and elm prefer boggy soil. Red oak and black locust grow well in sandy soil. In the heavy clays you will usually find the sugar and red maples and beech quite at home.

As for alkaline soil, the most optimistic thing that can be said about it is that some trees tolerate it. The western cottonwood does seem to thrive in it, if it can get enough water. The ailanthus and oriental plane can stand alkaline conditions and the California white oak and black locust have become acclimated to these conditions. The honey locust and elm also are fairly tolerant to such soil. Nor must we fail to mention the old stand-by of dry, warm sections, the eucalyptus.

From this glance at the tree-graph it may be seen that it pays one well to be careful in picking one's tree before ordering it from the nursery. In fact, trees should be chosen much more carefully than a garden is laid out for the trees probably will long outlast the garden. Certainly, one cannot push a tree around and transplant it as one does the perennials in the rock garden. The matter of feeding trees, too, is as important as fertilizing a garden. Trees exhaust soil just as do crops, and with modern lawns kept cut and raked there is little opportunity for leaf mold to form and decay. Therefore, if you want a fine tree, fertilize. Make holes with a crowbar under the drip line and fill with compost or use a compost and leaf mulch, perhaps topped with a rock mulch.

A regular yearly examination of the tree should be made by the owner or by a nursery to prune, examine for pests and fungous diseases as well as for cracks or broken bark. Tree surgery is a study in itself. Regular attention also should be given to trees along the street where they are likely to be injured by road oil or chemicals. Oil is quite injurious to sugar maples. If the oil gathers in pools over the roots of the tree it will soak down to the roots

Red Maple

and seriously affect the tree. Calcium chloride is an even greater danger. Used to lay dust on roads or get rid of snow and ice, this salt will leach through the soil. If the drainage is toward the roots killing will follow. It is worth while to see that this salt is not spread to any extent under or near your trees.

Paint also has a bad effect an sugar maples. If such a tree is painted all the way around to mark roadside limits or for some other reason it will die in a few years. Injury from leaky pipes of illuminating gas also is common. The leaves and small branches will slowly wilt and die, or if the leak is large the process will be quick. The tree may be saved only by aerating the soil near the source of the leak.

But now let us look at one of the most useful and valuable of shade trees in this country, one that is to be found in all but a few areas and which is planted both for its shade and for its wood, the linden or basswood.

The American linden is found in practically every section of the United States except the lower Mississippi valley, the Rocky Mountain region and the Arizona-Southern California district. There are other exceptions, of course, since the tree prefers the cooler states and is found south of Virginia chiefly in the mountains, although there is a small southern linden that appears even in Texas. Particularly, the linden is the popular shade tree of the midwest. This tree also is well known as the basswood and its botanical name is *Tilia Americana*. It usually grows from 50 to 70 feet in height but may reach 130 feet and have a trunk three feet through. It is a handsome tree, symmetrical, with heart-shaped leaves and a lovely flower blooming in May and June. The flowers are five petaled and sweet scented. Its fruit is about the

(*Continued on page 55*)

American Beech

With Tails We Win

GARBAGE DISPOSAL WITH EARTHWORMS

by MISS MARY CROWE

Miss Crowe in Her Garden

ARE YOU a suburbanite or a small town citizen for whom the "garbage man" never rings once (much less twice!) because there is no such? Or do you find "what to do with the garbage" the only, but none the less inescapable, bugaboo of life at your summer place?

Better still, are you one of the elect enlightened who wonders what's to become of us—if more generations continue to "plunder" the earth of its produce, all the while reducing to ashes what was meant to return to dust, or pouring the residue down the sewers to pollute the rivers, kill the fish, and "smell up" the whole country-side?

We can calm your nerves and ease your conscience! No fire or sewer has taken a scrap of our table refuse in years. In summer we bury it in our outdoor compost pits. In winter we just take it to the basement. There, in a fine 9' x 4' x 2½' concrete block pit elevated on one layer of 8" block for drainage thru a ½" pipe (the contents must be kept moist), several thousand earthworms operate our private garbage disposal plant on a budget that would turn a city official green with envy!

Take that clothespin off your nose please! There are NO ODORS, NO FLIES, NO MICE,—nothing but, come spring, a couple of tons of beauteous rich compost for the garden. And a nice clean conscience because *we've not destroyed anything.* We're creating—come summer—ten foot tomato plants out of our neighbor's discarded grass clippings, and fourteen foot pole limas out of our citrus skins and left-over mashed potatoes. It's a wonderful world we live in—with worms. They do all the dirty work. We get all the "pay"!

Earthworms for Composting

To build our "odorless garbage disposal pit" in our basement we laid, on the cement basement floor, one course of concrete block to elevate the pit floor for drainage. On top of the cemented concrete block we then poured a slanting cement floor with about a three inch tilt. In the lowest corner of this tilted floor we cemented a small pipe for drainage, into a pan. Over the pipe opening in the pit floor we cemented a small piece of copper screen to prevent clogging the pipe.

After "painting" the inside of the pit with MELTED PINE TAR PITCH (a brewery waste which can be melted just like sealing wax, and which waterproofs the cement and protects the earthworms from any possible toxic ingredient in the mortar,—and burns painfully if you don't wear heavy gloves when applying it, preferably with a "brush" made of heavy cardboard folded several times) we brought in several bushels of compost, with worms, from our outside pit.

Next we added a couple of bushels

Earthworm Soil Insures Vigor

each of cow manure and leaves, and a little soil sprinkled around, together with an occasional sprinkling of agricultural limestone and rock phosphate.

For more than a year we have buried large quantities of garbage in this pit without a single unpleasant whiff from it! The only caution is to *bury* the garbage several inches down, to keep the pit moist, and not to overload the pit before the earthworm population can cope with its "food" (garbage) supply. We rotate our "deposits" daily around the pit area. For instance, in one corner on Monday we bury a gallon of table scraps—citrus skins, melon rinds, egg shells, coffee grounds, *everything*. (Including bones which, like our dog, the worms play with but don't eat, though worms don't leave bones where they'll ruin the lawnmower!) Next Monday there won't be a trace left.

Since we live in the city we have no problem with dogs, rats, skunks, moles, etc. invading our outdoor pit. In the country it would probably be wise to build a concrete block pit, either above or below ground, on which a shoe-box type lid made of wood and ¼" wire mesh, or some other cover protection could be provided. (Use crushed stone, NOT cement, as a floor in an outside pit.)

The drain water from the indoor pit is marvelous fertilizer. Don't waste it. "There is no *waste* in Nature"—remember?

We built the basement pit with our own hands. We sought, and were given, no help from the masculine gender after following the advice of one "experienced bricklayer." He told us we could waterproof the mortar by mixing it with buttermilk, so we tried it. *But don't you!* We've been rather well rewarded for taking Nature's cue. We no longer have to wrestle with a garbage can lid in rain or snow in winter, and we have those delicious tomatoes (organically grown, of course) on ten-foot plants in summer.

Side of a Compost Pit

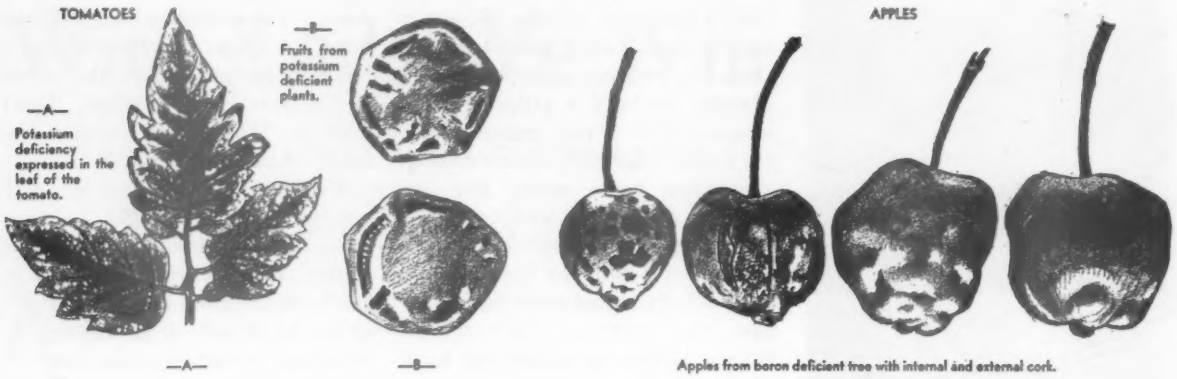
Soil and Health Foundation

FOUR series of fertilizer experiments have been planned at the Organic Farm this summer. In order to make the soil conditions as uniform as possible, circular beds made of cement have been prepared. These beds are 8 feet in diameter and have an area of one-thousandths of an acre. In each circular bed has been put 16 inches of subsoil and, over the subsoil, eight inches of topsoil. The subsoil and topsoil of all beds are from the same source. There are sixteen beds including four series of four beds in each series. These may be designated as series I, series II, series III, and series IV.

1. The four beds in series I have been treated as follows:
   3 lbs. of limestone, the equivalent of 3,000 lbs. per Acre
   5 1/3 ozs. phosphate rock, the equivalent of 300 lbs. per A.
   5 1/3 ozs. glauconite, the equivalent of 300 lbs. per A.
   10 lbs. of compost, the equivalent of 10,000 lbs. per A.
2. The four beds in series II have been treated as follows:
   3 lbs. of limestone, the equivalent of 3,000 lbs. per Acre
   6 1/2 ozs. of 5-10-10 commercial fertilizer, 400 lbs. per A.
3. The four beds in series III have been treated as follows:
   3 lbs. of limestone, the equivalent of 300 lbs. per Acre
   6 1/2 ozs. of 20% superphosphate, or at a rate of 400 lbs. per Acre
   5 lbs. of fresh steer manure, the equivalent of 5,000 lbs. per Acre
4. The four beds in series IV have been treated as follows:
   3 lbs. of limestone, the equivalent of 3,000 lbs. per Acre
   5 1/3 ozs. of phosphate rock, the equivalent of 300 lbs. per Acre
   10 lbs. of mulch, the equivalent of 10,000 lbs. per Acre
   Mulch consists of a mixture of pulverized leaves, alfalfa, and chicken litter containing droppings.

In each series of beds will be planted the following crops in a four-year rotation: oats, corn, wheat, and alfalfa. Careful data will be accumulated bearing on every detail concerning the soil, growth, health of plants, yield, reproductive capacity, and longevity. The purpose of these experiments is to compare organiculture with the conventional artificial cultural practices.

It is urged that all members and all interested persons who have not yet joined the Foundation, make a contribution as soon as possible so that these important experiments may be carried on successfully. Address your contributions to the Soil and Health Foundation, Emmaus, Pennsylvania.



Apples from boron deficient tree with internal and external cork.

DEFICIENCIES

Their Effects upon Plants

WILLIAM H. EYSTER, Ph. D.

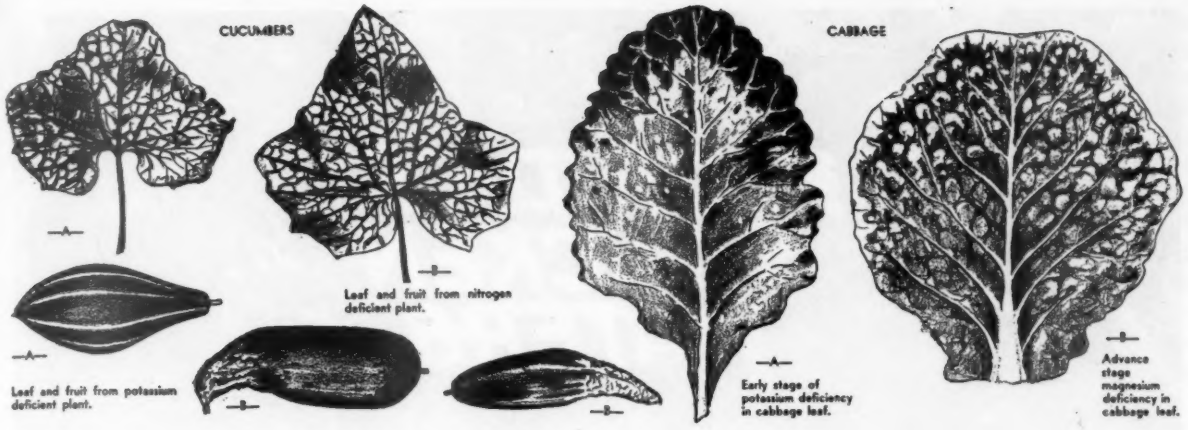
THE PURPOSE of this article is to review the contribution in *Soils and Men*, United States Department of Agriculture yearbook for 1938, page 807, by J. E. McMurtrey, Jr. and W. O. Robinson. The former is senior physiologist in the Division of Tobacco and Plant Nutrition, Bureau of Plant Industry, while the latter is a chemist in the Soil Chemistry and Physics Research Division, Bureau of Chemistry and Soils.

Since I wish the readers of *Organic Gardening* to get first-hand information on the importance of trace elements in the soil from the authorities mentioned above, I shall quote freely from their contribution already mentioned. These agricultural scientists say, "Because of its complex nature, the soil commonly contains small quantities of numerous chemical elements, certain of which, in suitable compounds, are necessary in small amounts for plant and animal development. Frequently, however, elements that are essential in low concentrations become toxic if they are available in slightly higher concentrations. Unusual soil constituents frequently occur naturally, or they may be added by man accidentally—and sometimes intentionally in controlling insects, rodents, weeds, or plant diseases—in amounts that are deleterious to plant development and to the animals feeding upon the plants.

"The response of the plant or animal to a deficiency or excess of an element in the diet can most accurately be recognized and measured by the symptoms produced. The actual quantities involved are frequently so minute that routine chemical procedures are not sufficiently delicate to measure amounts that produce striking effects on the plant or animal organism. Recent careful study of the effects of these elements on growth has supplied the explanation of failures in plant and animal development previously attributed to unknown causes or, in some instances, erroneously to other conditions.

"It is now generally admitted that for normal development, plants require the following chemical elements in suitable compounds: carbon, hydrogen, oxygen, nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, iron manganese, boron, copper, and zinc. Animals may require all of these and in addition sodium, chlorine, iodine, and cobalt. The quantities necessary for the normal development of plants or animals vary considerably. Those required in small quantities include iron, manganese, boron, copper, zinc, iodine, and cobalt. The members of this last group are the ones that commonly become toxic in slightly larger quantities than those required. Another group of elements that are toxic at relatively low concentrations includes aluminum, barium, chromium, fluorine, lead, selenium, and thallium."

The deleterious effects of the poisons which find their way into the soil from the use of sprays and dusts in attempts to control insects, pests and diseases have already reached the danger point in all crops that are being grown intensively, as orchards of fruit trees, tobacco, potatoes, and vegetables grown in monoculture as beans, tomatoes, and spinach. Often sprays are used in an effort to control "diseases" which are caused by deficiency of one or more essential elements in the soil. The growers of these crops have been using excessive amounts of both highly soluble acid fertilizers and poisonous sprays so that the soil is no longer



capable of providing the plants with their nutrients in proper balance. Recently a local orchardist brought to my office apples which had been sprayed 14 times but were hardly more than 50 percent clean. The apples had external cork due to boron deficiency which even a hundred sprays could not correct. This grower found it necessary to have each apple inspected individually, and with only 50 percent salable fruit the costs become prohibitive. The obvious answer to the problems of this and other orchardists consists in remineralizing the soil, in adding humus to the soil to absorb the toxic spray materials which have accumulated in it in injurious amounts, and to dispense with spraying so far as conditions will permit.

The deficiency diseases which Messrs. McMurtrey and Robinson refer to by way of illustration are given in the table below:

Deficiency Disease	Deficient Element
Sand drown of tobacco	Magnesium
Chlorosis of tomato	Manganese
Pecan rosette	Zinc
Yellows in tea	Sulphur
Internal cork of apple	Boron
Top rot of tobacco	Boron
Cracked stem of celery	Boron
Internal browning of cauliflower	Boron
Heart rot of sugar beet	Boron
Dry rot of sugar beet	Boron
Permanent wilt of tobacco	Copper

The remedy for all of these deficiency diseases is to be found in a light application of manure, or pulverized rocks containing the essential elements. It is important for the gardener and farmer to realize that such deficiency diseases are not caused by insects or by disease-producing fungi, and cannot be prevented or cured by the application of poisonous sprays and dusts. They are caused by a deficiency or absence in the soil of one or more elements which are absolutely essential to normal growth and resistance to pests and diseases. The obvious remedy for such diseases is *prevention*, and this can be accomplished by restoring to the soil the deficient minerals. This may best be done by adding liberal amounts of such natural materials as finely pulverized phosphate rock and finely ground potash rocks. These rocks, having been formed in the sea, contain a long list of the mineral elements which are essential to plant growth.

In this connection, Messrs. McMurtrey and Robinson say, "It is evident that in the future more attention must be paid to soil deficiencies of all elements essential for normal development of plants and animals. Larger crops grown on highly cultivated soils are exhausting the reserves in all cases where the crops are removed from the soil. There is also another potent factor operating in the same direction. The commercial fertilizers applied to obtain larger yields are for the most part comparatively pure salts, which through the phenomenon of base exchange tend to displace the secondary (trace) elements in the soil and cause them to be used by growing crops or carried away in the drainage water. These commercial fertilizers are different from farm manure in that they do not ordinarily contain enough of the secondary elements to be of any significance.

"While the continuous use of chemical fertilizers tends to deplete the essential elements not supplied to the soil, the use of stable manure, leafmold, wood ashes, and peat tends to conserve them. On dairy farms, a large part of all elements is returned to the soil, and the secondary elements contained in such concentrates as are purchased from the outside are therefore actually added to it. Leaf litter, leafmold, and wood ashes contain many of the elements taken from the forest soil in proportions desirable for the nourishment of the trees. The undesirable ones have been largely eliminated. Furthermore, the secondary elements in leafmold, particularly manganese, are in a very available form. In long-continued experiments at Woburn and Rothamsted in England, it has been found that stable manure has maintained the fertility of the soil over much longer periods than has the use of chemical fertilizers containing nitrogen, potash, phosphorus, and sulphur. The numerous chemical elements contained in the manure are undoubtedly an important factor in this observed maintenance of fertility."

(*Continued on page 56*)

FLORIDA'S STRICKEN WATERS

(Reprinted, with permission, from *Florida Wildlife*)

by H. R. BISSLAND and BILL WEEKS

This is the second of a series on the Water Hyacinth.

SOMEONE once said that beauty is often a mask for danger. This old axiom fits the water hyacinth to perfection. Its rich green leaves and soft lavender blossoms draw a strikingly beautiful picture, but beneath it all is a cold core of deadliness. The hyacinth is a killer that strikes ruthlessly at waterways, business enterprise, and even human life. Only in recent years has the weed come to be recognized as a menace to public health. Today health officials are as anxious to see the plant destroyed as are sportsmen and waterway engineers. The hyacinth and its relatives, pickerel weed and water lettuce, they have found, are the principal host plants of the Mansonia mosquito. This particular species of mosquito is a transmitter of two of the most dreaded diseases known to medical science, sleeping sickness and elephantiasis. The Mansonia, like other mosquitoes, does its breeding in stillwater lakes and ponds. However, unlike other breeds, its larva does not breathe through the surface of the water. It remains completely submerged and obtains oxygen by puncturing aquatic plants and breathing through the hollow stems. This clever characteristic makes it completely invulnerable to larvaciding. Right now state mosquito control men frankly admit that curbing the Mansonia is one of the toughest nuts they have to crack.

"Wherever there is a heavy concentration of hyacinths or similar plants, you'll find plenty of Mansonia mosquitoes," a state entomologist told us recently. Furthermore, he added, there is practically no means of controlling them unless the host plants are eliminated. The problem is particularly acute in the lake region of central Florida, where there are thousands of bodies of water, virtually all liberally spotted with floating aquatics.

The old nemesis of the Southland, the Anopheles mosquito, has also found a protector in the water hyacinth. The broad, thick leaves of the plant form a very effective umbrella when mosquito control units begin their spraying activities. The U. S. Public Health Service says a sparse to moderate concentration of hyacinths will reduce the effectiveness of larvaciding as much as half. Several years ago an Englishman who had observed India's water plant problem, came up with the theory that hyacinths actually helped curb mosquito infestation. Here in Florida, however, there is very little evidence to support his theory. Entomologists agree that mosquitoes are not likely to breed in a lake or pond *completely covered* with hyacinths. However, controlling mosquitoes in this fashion would be something like slicing off your head to cure a hangover.

Hyacinths that wash ashore to rot and discolor beaches cause thousands of dollars worth of property damage every year. At least half a dozen fishing camps in Central Florida have been driven completely out of business by the floating blocks. However, from a cold dollars-and-cents standpoint the plant has perhaps wielded its most telling blows in the rich agricultural sections of the Glades. This fabulously fertile muckland, reclaimed from a watery sawgrass wilderness, depends on an $18,000,000 network of canals and drainage ditches for its very existence. These important waterways are the vehicles for both irrigation and drainage—two equally vital problems in the area. For years hyacinths have played hav-

oc with both. Because of the flat terrain the canals and ditches are generally shallow and quite sluggish. In this type stream a moderate to dense growth of hyacinths will cut the rate of flow from 40 to 60 percent. During a heavy rainy season this condition can have but one result—acres of crop-destroying flood waters.

Strangely enough during drought periods hyacinths can have even more telling effects. In the first place they hamper the mechanics of irrigation. Weed-blocked channels have trouble delivering an adequate flow of water. Water levels are hard to raise when the surface of a stream is weighted down with a solid mass of hyacinths. On top of all this, hyacinths are notorious wasters of water. The transpiration rate of the plant is abnormally heavy. The Everglades Experiment Station has found that a dense growth of hyacinths will use up as much as 150 inches of water a year. This is two to three times the normal rainfall in this section of the state, and about 300 percent over the normal water loss through evaporation.

Growers in this area have long recognized the hyacinth as a deadly, money-costing menace, and not just a nuisance. After the rugged drought in the spring of 1945, Lamar Johnson, engineer for the Everglades Drainage District, said in a report to the district Army Engineers:

"Hyacinth block here (along Hillsboro Canal) was the difference between a normal crop and a short one . . ."

This also meant the difference between good business and not-so-good business for such ambitious towns as Belle Glade, Pahokee and South Bay. Members of the Everglades Drainage Board have known this for a long time. Except for a 10-year period of financial embarrassment, the agency has waged a continuous war against the noxious weed since the mid-twenties. At times it was forced to spend as much as $3,000 a mile to clear up stretches of its drainage system. Not until this year, however, was it able to sight any horizons of success. Today Engineer Lamar Johnson and his associates have finally cleared up miles and miles of important waterway, but they are not so sure how long they will remain clear. Johnson, one of the foremost hyacinth authorities in the state, knows the problem is still acute and will remain so until the weed is eliminated in the watersheds above him.

Unfortunately, hyacinth elimination is considerably easier discussed than carried out. Years of indifference has allowed it to gain a tremendous foothold. Those who know, estimate that it would take three years of concentrated, statewide effort to bring the plant under even a modicum of control. From then on it would be a matter of constant patrol and surveillance. Like the unholy garfish, the hyacinth has been admirably equipped by nature to carry on the fight for self-preservation. Biologically it presents an almost impregnable defense against extinction. As long as a single plant is allowed to live and grow, its future is assured. Even when the hyacinth is completely eradicated from a body of water, the fight is far from over. The University of Florida Experiment Station has found that hyacinth seeds will remain viable for seven years. Anytime within that period the menace is capable of cropping out anew, even though every vestige of the plant itself has been erased.

Some of the more optimistic stream improvement men feel that 10 years of concentrated effort could clear our waters forever and always. Still others feel that, no matter how comprehensive or how long range the program is, the correct nomenclature will continue to be hyacinth 'control" and not hyacinth "eradication".

All agree, however, that the key to either is a statewide program taken over and handled by one responsible agency. This is the policy Louisiana is now following with considerable success. After years of sporadic but futile control attempts by half a dozen agencies and private organizations, the state has now dumped the whole problem into the hands of the game and fish department. To finance the program the state legislature voted the department a million dollars out of the general fund. Up to now, however, Florida has remained in the watching and waiting stage. Much of the waiting is for action from the federal government. Congress has toyed with the idea of appropriating money for hyacinth control for several years now. Last session Rep. Dondero of Louisiana introduced a bill calling for $25,000,000 in federal money to combat the plague. The proposal died a lingering death in committee. Close observers in Washington are of the opinion that sooner or later federal monies may be made available for hyacinth control, but how much or when is another question. One high federal official told us recently that he believed action was another year away and that even then the money would be appropriated only on a matching fund basis.

This year the Game and Fresh Water Fish Commission took the bull by the horns and asked the Florida legislature for a higher license structure to raise additional revenue which could be put toward hyacinth control and lake improvement. How much weight this request will carry is a matter for conjecture. However, the commission feels it has at least started the ball rolling—and in the direction of the hyacinth it hopes. The Everglades Drainage District hopes to strike the pest a statutory blow from another direction. Lamar Johnson is asking the lawmakers to pass a measure prohibiting the sale or transportation of hyacinths anywhere in Florida. Unfortunately, many individuals are still taken in with the flowering beauty of the plant, and in South Florida, particularly, stores and roadside stands are selling or giving them away as souvenirs. Johnson feels that his bill will curb the spread of the plant to certain extent. Perhaps it will, but more important it will point up the seriousness of the hyacinth problem. Through the years the plant has cost Florida countless millions of dollars;

yet thousands still defend it because "it's so pretty." Others insist that hyacinths shouldn't be destroyed, but utilized in some profitable production. This theory sounds good, but unfortunately it hasn't turned out to be very practical. Through years of experimentation scientists have found that hyacinths can be used in the manufacture of paper, storm sheeting and a certain type fertilizer—but not profitably. The composition of the plant is 96 percent water. This high water content makes it a poor bet for any sort of industrial use. One of the state's foremost soil scientists, after nearly a decade of experimenting with hyacinths, summed up his conclusions in one laconic sentence:

"The water hyacinth," he reported, "is not worth a damn for anything!"

What, exactly, is this "Jekyll and 'Hyde" plant that has caused us so much trouble, and where did it come from? The technical designation for water hyacinth is *Eichornia crassipes*, and according to botanists it is "a perennial, mat-forming, floating aquatic of wide distribution in tropical and sub-tropical regions." Its introduction into Florida has been the subject of considerable legend and a few well-colored lies. Actually the weed was introduced in the St. Johns River sometime between 1884 and 1886. In 1884 the Japanese government imported several hundred of the plants from Venezuela to decorate its display at the International Cotton Exposition in New Orleans. With a fine show of generosity, the Nipponese presented samples of the pretty flowers to several enthusiastic visitors. Among the happy recipients was one Mrs. W. F. Fuller of Edgewater, Fla. Mrs. Fuller promptly took her prize back home and planted it in a garden pond. The plant thrived beyond her fondest expectations, and in no time at all her tiny pond was adorned with a fascinating carpet of lavender and green. Mrs. Fuller was captivated. This, she decided, was too good a thing not to share with the other flower-lovers of the state. So in a burst of public-spirited benevolence she plucked a few dozen little bouquets from her floating garden and happily sprinkled them into the St. Johns River.

The hyacinths took it from there. By 1890 the river was so jammed steamboat lines were appealing to Congress for help. In 1896 the U. S. Department of Agriculture sent a botanist named Herbert Webber down to survey the situation. Webber reported that things were very bad indeed.

That summer, he pointed out, a strong north wind had driven the plants from Lake George up the river, "forming a solid mass entirely covering the river for a distance of 25 miles." On the basis of Webber's report Congress appropriated $5,000 to "study" hyacinth conditions in the State. About that time Florida's infant cattle industry took note of the fact that cows fed on the new plants with apparent relish. Anxious to supply their scrawny herds with additional graze, the cowmen loaded up bags of hyacinths from the St. Johns and carefully transplanted them in lakes and streams near their own ranges. Actually it wasn't until a few years ago that ranchers were convinced that hyacinths did more harm than good as a cattle feed. The plant contains very little nutritional support, yet cattle will often take it in lieu of grass. The net result is a bloated cow instead of a fat one.

Drawing of water hyacinth plant to show root system, buoyancy leaves, and flower cluster.

Meanwhile, the federal government had put its $5,000 to work in an effort to find a method for eliminating the spreading menace. The first concrete control effort was made in 1897, when a crew of men and tugboats attempted to float the plants out to sea. The effort met a notable lack of success. Next a rig designed to crush the plants in the water was introduced. This worked fine, but within two weeks it was all to do over again. Finally in 1902 someone conceived the bright idea of spraying

(*Continued on page 57*)

MISCELLANY

I WANT to thank the many readers who are sending in to us valuable newspaper and magazine clippings. Without their wonderful assistance the conducting of this department would be impossible. I would like to make one suggestion, however. When you read an article attacking the organic method be sure to send it in to us but also write to the newspaper or magazine man who is the critic and tell him things from your own experience. We must get into the hair of the opposition. I recently gave a talk on the organic method at the Connecticut Agricultural Experiment Station, and one of the professors said to me afterwards, "Mr. Rodale, you serve a good purpose. You are gradually needling us into investigating the claims of the organic method." And I am happy to say that at this Connecticut station (New Haven) even before my talk, they already were beginning to experiment with it. Also, there is brewing a big surprise for the organic movement in another Government station in which negotiations with us are now underway, tentatively approved, and regarding which I hope by next month to be able to make a startling announcement. It is a new phase in the organic method. Please stand by.

Rothamsted

It is amazing how unfair our critics can sometimes be. Time and time again we see in print a reference to the famous British experimental plots at Rothamsted, England in which experiments were carried on over a good part of a century, growing wheat with chemical fertilizers and also with stable manure, and the opposition invariably states that the yields from the chemical plots were superior. This is absolutely incorrect. Let me quote from the U. S. Yearbook of Agriculture *Soils and Men*, 1938, page 811: "In long-continued experiments at Woburn and Rothamsted in England, it has been found that stable manure has maintained the fertility of the soil over much longer periods than has the use of chemical fertilizers containing nitrogen, potash, phosphorus and sulphur. The numerous chemical elements contained in the manure are undoubtedly an important factor in this observed maintenance of fertility." On the same page, this book says, "the secondary elements in leafmold, particularly manganese, are in a very available form". Why doesn't the opposition experiment and find out?

Spray Poison

Robert de Wolfe, a garden writer in the *Detroit Free Press* (Aug. 21, 1949) gives advice on how to prevent wilting of vegetables which he says can often be traced to fungus infection, are most noticeable he says on peppers, egg plant, tomatoes and potatoes. He refers to the fungus organism *Verticillium*. These chemical gardeners must study the names and habits of all kinds of complicated disease-producing organisms so that they may know how to cope with them, while the average organiculturist is basking in the luxury of a garden practically free of these pests. And what a luxury that can be! Ask the man or woman who used to be a chemical gardener and now practices the organic method!

Mr. deWolfe, in his article, suggests that where such a disease-producing organism exists the soil must be sterilized by the use of formaldehyde. Formaldehyde! What a terrible poison! Imagine letting the roots of your vegetable plants grow in a soil just saturated with a solution of formaldehyde. What does this solution do to the antibiotic organisms, the penicilliums, the little policemen of the soil? It actually kills the policemen and the criminal. Chemical gardeners are extremely hardy creatures to bandy about such vicious things as formaldehyde. They should know better.

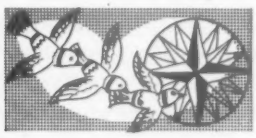
Potatoes With Atomic Energy

The Atomic Energy Commission announces that its scientists are experimenting with a method of using atomic energy rays to speed the growth of potatoes. At its Brookhaven, N. Y. laboratory potatoes have been exposed to different dosages of X-rays, similar to the ray released in touching off an atomic bomb. Under such treatment tubers were found to start new growth where they did not without the treatment. They do not know the cause, and additional work is being carried on. We can be sure, however, that one phase of this matter will not be experimented with—that of testing the effect on the health of people eating such atomically treated potatoes. That does not belong to the department which has to do with growing food. Such testing should be done by doctors. The reason doctors should do it is not only because they owe it as an obligation to the public, but to their own families—wives and children who might eat such potatoes. Come on, doctors, don't be afraid to cross the line, into the work of the agriculturist. Both are interrelated.

Waste Sugar Cane

The plant residues left after pressing the sugar out of cane are called bagasse. This material has been a problem to the sugar cane grower who did not know how to compost this stubborn material. Now they are conducting experiments to turn this waste into newspaper pulp. But that is wrong. This plant waste should be returned to the soil, to increase the soil's fertility for growing more sugar cane. To make newspaper out of it is to rob the soil of what it badly needs. There is a huge amount of this bagasse available.

That is why the newspaper industry is looking at it with such greedy eyes. If the same engineers who are to experiment in turning bagasse into newspaper pulp would experiment in turning it into humus, they would not only be doing a work more helpful to humanity, but I feel that they could also make the same amount of money, or possibly more, than if they succeed in making bagasse into pulp for the newspaper industry. On second thought, when you consider the evil effect of sugar on health, you wonder whether they should not make paper pulp out of the bagasse.



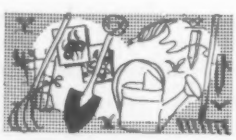
Organiculture

Several years ago one of our readers suggested that we use the name of *organiculture* (organiculturist) to cover the field and practice of organic farming and gardening. The suggestion took root and the name is being used a great deal. This was all right so long as we were using only organic matter. But now since so much stress is being placed on the use of ground up rocks—not only phosphate but potash, and other rocks rich in minerals, a more technically correct name for the method would be *organomineral culture* and the person practicing it, an *organomineralist*. However, I am not making this suggestion with a view of changing the title. I believe that organiculture is by far the better-sounding of the two. The organic part of it can be considered as being used in our specialized sense covering the whole organic method. The advantage of the term *organomineralist*, however, is that it shows our chemical critics that our method is a most scientific one, taking in organic matter plus minerals, the same as theirs except that we leave out the acids that are put with the minerals to make them more soluble and which make them a chemical fertilizer.

Poisoned Radio Beams

The State of Pennsylvania is experimenting with the use of a "poisoned" radio broadcast that is effective over a radius of 100 miles from the point of broadcast to kill insects and smaller organisms. They state that with this method it will be possible to increase agricultural production to incredible heights. For several years such tests have been going on near Harrisburg by the Research Division of the Pennsylvania Farm Bureau Cooperative Association. In the last year 52 tests were conducted with a machine which it is said can poison by a radio wave. It killed Japanese beetles and other pests. They say that potato plots treated by radio produced 48.8 more bushels per acre than nearby control plots which received seven regular poison sprays. They claimed that diseased American Elm trees were stimulated and improved after radio treatment from a distance of 14 miles.

Who knows? Perhaps such a method may someday be found that will be a safe one, but can it also be a Frankinsteinian monster that will destroy man by subtle invisible effects on food so produced and on people who cross the path of the rays. The item in the *Farm Bureau Mirror* for March 1950 says: "The principle theory of all the UKACO Process is that all molecules of matter, in constant vibration produce electrical impulses and 'broadcast' them much in the manner of tiny radio stations. The inventors say each molecule can also receive a broadcast if the incoming waves are of the corresponding frequency." The question is, "Is science getting beyond the capacity of man to comprehend?" What does man know about the ultimate effect of sending a broadcast into a molecule? Is man fooling himself and merely playing a game of being a scientist without being a real thorough one? I am not in a position of giving the correct answer. But there is such a soothing simplicity in sticking to a primitive naturalness—feeding the soil with the organic roughage which it needs. Who knows the effect of an entire country practicing *organomineral culture* for a century and its effect on the soil and the people. It might bring about a golden era of human well-being and happiness.



Carbon For Soil Heating

According to a report in *Industrial Engineering Chemistry*, experiments are being conducted with carbon black, a powdered material obtained from natural gas and used to make tires tougher, to increase soil temperatures. The darker a soil the more heat it absorbs from the sun. That is one advantage of enriching soil with organic matter. The more organic matter the soil gets, the darker it becomes and the more heat it will absorb. This is of great advantage in the early and late growing seasons.

In the experimental work two tons per acre of carbon black was applied in the top two inches of soil and it raised the temperature at the surface, in the spring and summer, about two degrees fahrenheit; at a two-inch depth the temperature increase was 3.4 degrees. The idea is to get the soil warmer for earlier planting in the spring. The organic matter which we use contains large amounts of carbon sometimes as high as one-half of it. The question is—do you want the carbon of the organic matter, or do you wish the carbon obtained from natural gas. Carbon black costs anywhere from 3½ to 7 cents a pound. That from organic matter is much cheaper and may be much safer. Some enterprising agricultural experiment station should experiment with every phase of the use of carbon black, before it is loosed upon the unwary farmer.

Cows and Dentistry

Dr. L. M. Hurt, president of the American Veterinary Medical Asso-

ciation in Chicago recently said that cows should see their dentists twice a year just as human beings. This will give a higher yield of milk, he said. Today cows suffer from a condition known as scissor-mouth, where the lower jaw is narrower than the upper one. Unless her teeth are dressed, the cow, with such a condition, cannot eat comfortably. Is this an affliction of present day cows and was it much less prevalent a hundred years ago?

Dental scientists claim that the bone of man's jaws and teeth are degenerating due to his devitalized diet. Man and animal are what they eat. I feel that the cow's tooth trouble is only another symptom of modern commercial agriculture with its accent on chemical fertilizers, poison sprays and such artificial practices as artificial insemination and breeding for huge milk production. What they do to cows! Where is the Society for the Prevention of Cruelty to Animals?

Are We Healthy?

I don't think it is correct to measure health by referring to the death statistics. There are other alarming factors that are concealed in the shrouds of the mortality figures. Let us take tuberculosis as an example. Deaths from this disease are being reduced every year but I was amazed to learn the other day that actual cases of tuberculosis are increasing.

From 1940 to 1947 tuberculosis deaths were reduced from 60,428 to 48,064, a reduction of 12,364 deaths, but during the same period new cases of the disease increased by 33,065, that is from 100,772 to 133,837. Of course some of this increase is due to the mass X-raying that is taking place all over the country but Dr. Herbert R. Edwards of the New York Tuberculosis and Health Association who is responsible for the above figures says that that does not begin to explain the entire increase. This means that although fewer people are dying of this disease more persons are going around with the collapsed lungs and the effects of the new daring surgical procedures which saved their lives. The medical profession points with pride to the continually decreasing death rate but it does not speak of the serious chronic disease condition with which the country is afflicted. The same thing applies to pneumonia as to tuberculosis—more cases but fewer deaths.

What is at the bottom of the increasing number of people who are contracting these diseases? I don't believe I have to tell readers of this magazine what it is. To a great extent it is malnutrition, the eating of devitalized foods that are taken in quantity, but which do not satisfactorily nourish the human organism.

Bermuda

My oldest daughter Ruth, who is 20 years old, recently spent a ten day vacation with a group of college girls in Bermuda. In a letter to me she says in part, "Yesterday was really my best day. I set out alone, with picnic lunch under arm to tour the island by bicycle. Almost everybody does it by taxi, but it is much more fun to bike it—if you can take the exercise. My first stop was the Agricultural Station, a magnificent place. Their biggest project right now is thinking up a way to control the scale insects on the cedar trees. The islands are rapidly being cleared out of them, as the U. S. lost the chestnut trees. They are trying to breed beetles which eat as many scale insects as possible. The woman in charge of the work took me into their laboratories where they were growing the scale on potatoes to feed to young beetles. The same woman has read many copies of O. G. and wants to start an organic garden. She called up the man from whom she heard about O. G. and he sounded overjoyed to have a semi-official visitor from our clan."

—J. I. Rodale

Lower Temperature Means Higher Quality for Fresh Vegetables

If prepackaged fresh vegetables are kept at a temperature of 42° F. during marketing operations they will keep from two to three times longer than if no attention is given to refrigeration, say transportation and storage specialists of the Bureau of Plant Industry, Soils, and Agricultural Engineering, of the U. S. Department of Agriculture.

Most recent evidence they have on this score comes from a study conducted with funds from the Research and Marketing Act in which broccoli, Brussels sprouts, and cauliflower were wrapped in various types of transparent film shortly after they were harvested. Then they were tested under market conditions. One batch was held at 67° F., which approximates store room temperature in the average market during fall and winter months. Another batch of the vegetables was held at 42° F., which is about the temperature of the ordinary home refrigerator. Nonwrapped lots were also tested at these two temperatures.

Results showed that some types of plastic wrappings are more satisfactory for fresh vegetables than others. All of the wrappings afforded some protection of quality. The nonwrapped lots lost weight rapidly.

The widest variations in quality, however, resulted from differences in temperature at which the vegetables were held. At 67° F. none of the prepackaged vegetables was salable after 4 days. But at 42° F. the packaged cauliflower remained fresh in appearance and satisfactory in flavor for 8 days. And the Brussels sprouts and broccoli remained in a salable condition for 11 days.

Greenhouse Gardening

PLANTS AND FLOWERS

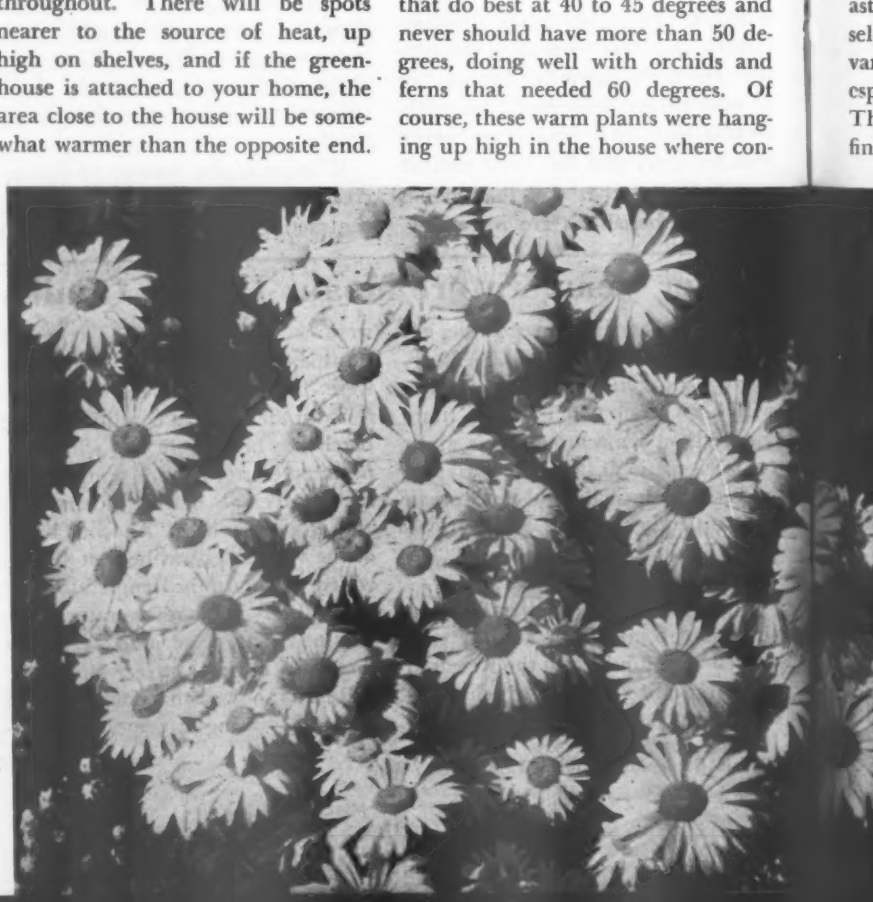
by ERNEST CHABOT

Interior of Home Greenhouse

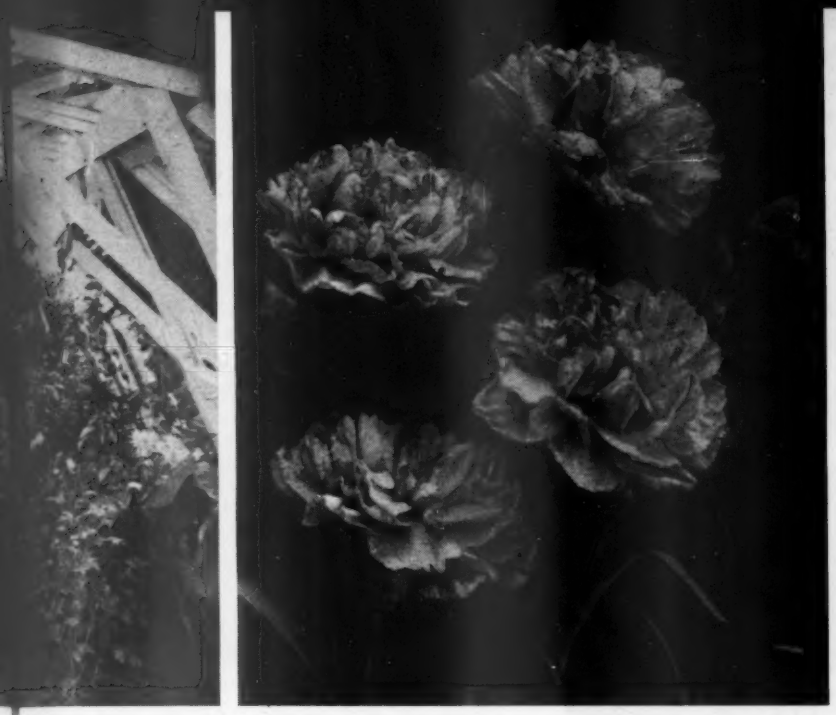
IF YOU love to grow things and have been raising plants upstairs, downstairs, and even in the cellar, then you should certainly have a greenhouse. It will double your garden season and fill your days with happiness and sunshine. Not only will you raise things you never thought possible before, but you will find gardening under glass much more productive with half the effort required out of doors.

What most home gardeners want is a good show of flowers from September until Spring.... A splash of color that makes something in you sing when all is bleak and cold out of doors. Contrary to popular belief, the greenhouse in which you raise such flowers is far from being a "hot house". The fact is, most of the fast growing annuals we all enjoy so much are grown in a "cool" greenhouse and suffer if temperatures run too high. They do best at a temperature of not more than 50 degrees at night and a daytime temperature of 10 to 15 degrees higher by the sun's heat. You see, plants will suffer no ill effects from the higher natural heat, but growth becomes soft and weak when the temperature runs above the requirements of the particular variety of plant by artificial heat.

The first step, therefore, in selecting crops to grow under glass is to choose things that are compatible together. Greenhouse temperatures may be classified for this purpose as cool, moderate, moderately warm and warm. In most greenhouses, the temperatures are not exactly even throughout. There will be spots nearer to the source of heat, up high on shelves, and if the greenhouse is attached to your home, the area close to the house will be somewhat warmer than the opposite end. The temperature will not vary greatly, but perhaps about 5 to 8 degrees, just enough to enable you to grow some things that require a higher temperature in the same house with cool plants. I have seen Camellias that do best at 40 to 45 degrees and never should have more than 50 degrees, doing well with orchids and ferns that needed 60 degrees. Of course, these warm plants were hanging up high in the house where con-



Daisies



Carnations

ditions just happened to suit them.

In the cool greenhouse, you can have most of the annuals and biennials you enjoy in your summer garden; snapdragons, calendula, sweetpeas, forget-me-nots, marigolds, asters, and the like, but be sure to select seed of the winter flowering varieties that have been hybridized especially for greenhouse gardening. They do better and give you much finer flowers than is possible even in the summer garden. A few of the others that might include your favorites are; pansies, fragrant stock, carnations, chrysanthemums, marguerites, Boston yellow daisies, geraniums and primroses. You could go on and on

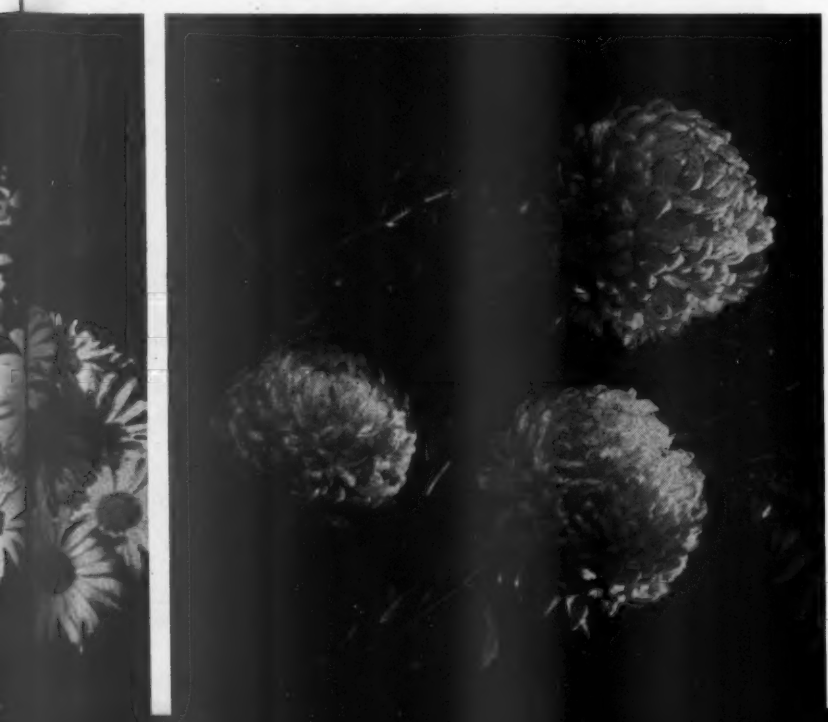
Blooms from bulbs (tulips, daffodils, hyacinths, lilies and iris) make a grand show from January on and are the easiest of the things you grow under glass. By planting several hundred in the colors and variteies you like best, you can have a continual flower show that will be a joy to your family and friends. The blooms come faster in a moderate to warm temperature, but are just as welcome a few weeks later in the cool greenhouse where they produce flowers with even greater substance.

The brilliant poppy-like flowers of anemone and ranunculus that are grown from corms and tubers are also outstanding among the flowers you can grow in the home greenhouse. They flower from February on and are excellent for cutting. Freesias, in white, yellow or lavender that are so delicately fragrant, should not be excluded either, and make an excellent subject to grow on your shelves.

Fresh vegetables may also be had from the small greenhouse, but only a few are profitable to grow. Lettuce, radishes, scallions, parsley, chives and many others can be grown in a comparatively small amount of space in the cool greenhouse. Cauliflowers, beets and carrots do very well, too, but take too much space to produce any quantity. Tomatoes and cucumbers are widely grown in greenhouses commercially, but also take a very large greenhouse and must be grown at a night temperature of 60 degrees or higher. It is easily possible, however, to have fresh tomatoes from just a few plants in the late fall and again in the early spring in a cool house. If the fruit is set by September, it will grow on, ripen and supply your table up through December. A spring crop started from seed in January and benched in March, will bear fruit at least six weeks before the outdoor plants come in. Cucumbers and melons are only practical as a summer crop in the small house for they need space and higher temperatures. It is grand to have the large, juicy melons that can be grown to perfection under glass in the summer and cucumber with seeds so soft there hardly seem to be any at all.

One of the most profitable things

(*Continued on page* 58)



← Chrysanthemums

Left—The Old Wood Shed classification with the antique jugs, baskets, benches and many other appointments created a little sensation. The weather beaten background was both flattering and appropriate to Old New England. This mass arrangement by Mrs. Mark Werman, Temple Club, was rich with the golden daffodils and forsythias.

Below—The arrangement of the Driftwood, pussy willow, pinks, and tulips with the king of the barnyard won a tri-color prize. It was superb, and the creation of Mrs. Edward D. Leonard, New Center Garden Club.

Old and Modern New England Floral Arrangements

ANN ANDREWS

This spring, the Boston Flower Show went all out for the Old and Modern New England theme. The arrangements were wholesome and conservative, and in sharp contrast with the New York Flower Show which carried the modern theme in the six large arrangements, all interesting and original.

Artemesia frigida

Silvery Foliage for the Rock Garden

(A series)

by G. L. WITTROCK,
Assistant Curator of Education New York Botanical Garden

WHEN one thinks of the Artemisias or Wormwoods he associates the group with aromatic and bitter herbs or small shrubs, medicines, and sage. However, there are plants in a section of the genus that can be and are used in horticulture for their beautiful, silky, silvery, greenish-white, finely-cut foliage. A number of these silky species are found to be of merit in Rock Gardens and as border plants. The floral parts, however, are not conspicuous, often much suppressed, but tufts and colonies of the plant, or borders of them are attractive.

The genus Artemisia of the Cardiaceae or the Thistle Family is listed with 280 species and it ranges in the North Temperate Zone from almost desert regions to the alpine snowlines, being most abundant in arid sections. The genus Artemisia was named after Artemis, the Greek Goddess corresponding to the Roman Diana.

The species we suggest for the rock garden is our American species, *Artemisia frigida*. It is known locally also as "Colorado Sage," "Pasture Sage," "Wormwood Sage," "Wild Sage," "Mountain Fringe," "Fringed Wormwood," "Mountain Sage," and "Sierra Salvia." It is found native on dry plains and in rocky soils from Minnesota and Nebraska to Saskatchewan, Yukon, Idaho, Texas and Arizona, and some authorities extend its range to Siberia.

The plant is perennial, woody at the base and densely silky-hairy all over. The stems are ascending, either simple or branched, 8 to 20 inches high. The leaf is ½ to 1½ inches long, palmate in outline and 4 to 5 times dissected into short linear lobes, each lobe less than one-tenth of an inch wide, thus giving a finely lace-like appearance to the blade. The flowers are borne in numerous tiny heads on a raceme or rarely branched spike. The yellowish-white inflorescence is odd, but the major attraction is the silvery, silky foliage covering the whole plant, forming either a globular tuft, clump or mat; it is always a point of beauty and interest within a rock garden throughout the growing season from spring to autumn. The species was introduced into horticulture in 1883.

Propagation is mostly by division. The plant thrives under most ordinary conditions, even in poor, dry soils. It requires practically no care and can be planted in most exposed places within the rock garden either as individual colonies or as border plants. The plant is used locally as a diaphoretic, antiperiodic, and as a laxative.

American Indians also found the plant to be of medicinal value. Tribes of Montana prepared a decoction of the plant for lung troubles and fevers, and chewed the leaves as a remedy for heartburn. Wisconsin Indians cultivated the plant and used it as a fumigant to revive a patient from a coma; the flowers and foliage were fumed in a pan of live embers, and the smoke was directed into the nostrils of the patient by using a cone of paper or birch bark. The Hopi Indians of Arizona put some of the plant on their prayer sticks or "Paho"; they also added some leaves to the sweet corn when they roasted it. The Chippewas dried and crumbled the leaves and placed them on hot stones. The smoke thus created was directed into their clothing to prevent contagious disease; it was also used to fumigate their homes.

There are other silvery species such as the "Silky Wormwood" or *Artemisia glacialis*. This species is smaller and much more alpine in character. We recommend our American species for the rock garden since it thrives best under all conditions. Colonies of this species have been an attraction throughout the growing season in the rock garden of the New York Botanical Garden.

Cover Crop

Sheet Composting

by REYNOLDS A. MORSE

SEVERAL weeks before the revolutionary issue of *The Organic Farmer* arrived in which the pioneer composter J. I. Rodale admitted to the fact that on any kind of farm scale, pile composting was very limited, and could be duplicated in effect by sheet or field composting, I had arrived at the same conclusion. My education in this respect was both painful and amusing.

Even with three 5 x 5 starter and one 4 x 4 finisher compost piles going, using the litter and droppings from 75 hens, plus earth and garbage, as well as our green leaves and all other garden waste, I was not able to begin to make enough compost for the 1/3 acre organic truck garden I am developing.

After a full summer's assiduous attention to my several piles, which I interlarded with wood ashes and limestone powder, and finished up with red English manure worms in good organic fashion, I proudly got out my cart and hitched it up to the tractor to haul away the moist rich humus I had successfully made. But my green and hopeful visions of a truly enriched organic truck garden plot quickly faded: all my season's composting efforts covered only a 30 x 50 ft. area with the thinnest dressing! A whole year's back-breaking efforts at compost making were spread out in a single hour, and then I knew for certain what the term "pile shrinkage" meant. The lonely dark patches of compost made the relatively raw earth look lean and hungry in between, and I realized first hand that composting's chief limitation was definitely going to be one of securing quantities enough of the materials. I could see even in a fully mechanized composting operation only a minute relief for a farm soil.

I thought of the tons of orange peels, lettuce trimmings, meat scraps, coffee grounds, and other garbage wastes whose biochemically combined minerals are forever lost to mankind in any city. I realized that these elements necessary for life did not enter into the various food residues by a routine chemical process that we could duplicate in the laboratory, but by a complex biochemical process occurring only in nature and which we only dimly understand. And the futility of trying to save this as yet unvalued wealth and to return it to the soil, even on a small scale, overwhelmed me that day, as I raked up the last remnants of brown compost from the ground to scatter in the new pile just started.

Stubble Grass Cover

If ever an organic gardener surveyed his prospects with dismay – with brown thoughts in a brown shade– it was myself after I had spread my 1949 compost that sunny autumn afternoon.

But after reading the recent issues of *Organic Gardening* and *The Organic Farmer,* I took heart again, and arranged to have some 20 loads of village leaves dumped on the garden plot. I first tried a commercial grinder, and then tried one of my own design, but only saw more work than I could possibly accomplish in processing such a huge mountain of leaves. I then tried bull-dozing the leaves into place and discing them in, but the discs rode the leaf mats, and finally it was too wet to use the tractor any more. So I next set out to turn the leaves in by hand–a winter-long project made possible by freak weather which has not yet frozen the ground. Now even my mountains of leaves are shrinking and being eagerly absorbed by the hungry ground. As I haul them off to the edge of the garden and fork them under, I have plenty of time to mull over methods of handling leaves on a commercial scale; it is not the simple problem that it seems at first. Once the leaves are in place and slightly mixed with soil, however, they disc very nicely.

Prior to the arrival of the leaves, I planted winter rye over my entire garden area, and this of course is being turned under with the leaves. Unfortunately, I am thus exposing bare ground to the weather, and in so doing I realize I am not following sound organic principles to the letter. Only by sheet composting, however, can I restore to my plot the "forest floor" soil condition I am after. I see no way out, unless I allow the leaf piles to rot over the winter, and then spread them in the spring. The handling of such huge piles of leaves for proper composting, however, seems far too much work for the results obtained. Furthermore, the shrinkage already is such that I may not even have enough leaves to interlay even one third of an acre, where a month ago I despaired of ever seeing my garden again for the golden mountains of leaves.

I will supplement the leaf material with ground minerals (limestone and phosphate rock) and occasional compost in the garden rows, but I now feel that I can accomplish much more on a practical level by field composting.

I have already noted that sheet composting causes a far more rapid growth in the overall worm population than spreading ripe compost, and trying to raise worms on a small but concentrated scale. In fact on this basis alone, sheet or ground composting will recommend itself to the large scale gardener or farmer, for worm population is multiplied over a much larger area than would be possible with previous composting methods. Where I counted only 2-3 worms per cubic foot, within a month of being enriched with a thick leaf mat, I have counted over 30 worms in a comparable cubic foot, and this population increase took place during the calendar month of December!

One of the frequent criticisms of the organic method is that it is applicable only on a small scale, and it is indeed true that to duplicate

(*Continued on page 59*)

Our Native Shadblow

A Small Native Tree with Horticultural Possibilities

by HENRY S. KERNAN

Shadblow trees in bloom

OUR native shadblow, or serviceberry, is a plant of many distinctions. From Labrador and Alaska south to Mexican Oaxaca, no section of the continent is without these elf-like little trees, or more often shrubs, whose plump, firm fruit-wise berry-pickers do not pass by. During the heavy-scented days of midsummer loose purple-red clusters can be seen drooping from the long, pliable branches in striking contrast to the glossy green foliage. They are not difficult to gather; and were not so many other wild fruits crowding one upon another in lavish haste, they would come nearer to the respect they deserve. More cloying than the blueberry and less tart than the blackberry, they are still delectable morsels whose delicate flavor is best enjoyed when cooked with a touch of lemon or quince in muffins, pies or preserves. They were formerly an important source of food with the Indians, who gathered and dried them in large quantities to make pemican.

Although shadblow has never been cultivated to any extent for food, the possibility has been recognized and it is at least on the horticultural waiting list.

There are about twenty-five species, three of them arborescent, of which the western *Amelanchier florida* and the eastern *Amelanchier laevis* supply most of the edible fruit. Besides their value for food, they are extraordinarily handsome, especially when seen in the earliest days of spring just before the landscape breaks into green. Then they raise a mass of snow-white blossoms that stand out even at great distances like tiny clouds anchored against the still grey-brown of the woods' edges and old fields that are their favorite haunts. Their lovely appearance is aided by the woolly white or red of the uncurling leaves, which later become a delicate green, and finally a clear yellow before they reach the ground in the fall. The bark is a soft ashy grey or reddish brown. The trunk is often branched at the ground, but in the dense forest will sometimes rise in a clear bole with little taper to heights of seventy feet and diameters of nearly two.

Typically however, the shadblow is, like the wild-life that feeds upon it, a phenomenon of edges. In the

←
Flower Clusters of our Native Shadblow

ever-changing belt between the high forest and the open field, the rather open, spreading crown can take full advantage of the sunlight. Here it supplies food to large numbers of songbirds and small game, and whitetail deer. Cases have been observed of its literally being torn to pieces by black bear.

Like other members of the rose family, the wood is heavy, dense and hard to split. It can be easily worked and is sometimes used for articles of turnery. Scarcity and small sizes obviously limit the commercial use.

For their many fine qualities gardeners have long had their eyes on the shadblow. Work with the single European species began at least as early as the sixteenth century; while American specimens appeared on English estates in 1746. Experimentation has yielded a pink variety and several hybrids. On the whole, however, they have not proved amenable and are not in general use as ornamentals. Those who know the shadblow best are probably glad. There is a wild, wind-blown quality about these little trees that defy transference to formality.

In the popular mind, the shadblow hovers between the known and the unknown—a fact reflected by the confusion and abundance of the common names. An oak is always an oak; a pine, a pine. But the shadblow is forever being compared to something else. Is it an apple, a pear, a cherry, or a currant? All four have been used, often with the word Indian or the name of a month tacked on to add to the mix-up.

According to botanical custom no popular name that has ever appeared in print will drop out; and hence such monstrosities as May cherry and Indian pear will be repeated until the end of time. Why the early settlers on the eastern seaboard chose to connect the appearance of these showy blossoms with the runs of shad, is hard to say. Without doubt, however, the names shadberry, shadbush and shadblow had their origin here. But as a matter of phenology, robinberry would do as well.

In the United States, serviceberry is probably the most widespread term. It orginated in the southern mountains and stems from *sorbus*, the botanical name for the closely related rowan tree of Europe with which the colonists were familiar. Only a Blackfoot Indian (and a rare one at that) could explain saskatoon; while the Mexican tongue-twisters tlaxisqui and tomislacati are in the twilight of a forgotten tongue.

Not so the botanical name *Amelanchier*. In the present form this word undoubtedly comes from the region about Marseilles in southern France where it is still in current use. It has even been traced back to the Greek settlement of the area in the seventh century before Christ. Sailors arriving from their homeland had no word to describe this diminutive fruit and called it half-apple or hamamelis. The word took hold, and in the 18th century the tenacity of 24 hundred years was rewarded by Linnaeus when he made it one of the few popular words to be accepted botanically.

I don't believe *that*

by LEONARD WICKENDEN

I FIRST ran into this doctrine at a Garden Club of which I was a member. A young man from the Department of Agriculture gave us a lecture on growing vegetables and during the question period somebody asked him why he had talked about so many vegetables without mentioning peas. His answer was that peas did not grow well in this part of the country. The climate did not suit them, they were subject to all kinds of disease, and they were attacked by aphids and other pests. The yield was so small that they were not worth the space they occupied.

Next, the Editor-in-Chief of a gardening magazine bemoaned the fact that whereas peas were easy enough to grow when he was a boy he was now thankful when he got peas enough to make picking a real job.

Then, in the book 10,000 *Garden Questions Answered,* published by Doubleday Doran, the first question on peas was: "Are green peas very hard to raise?" The slightly ungrammatical answer was: "In sections where hot weather, and especially hot nights, is likely to come suddenly, they are difficult." Well, this year we had hot weather with a vengeance. It came suddenly and stayed long. From the last week in May to the second week in July we had no significant rain and blazing sun day after day. I did not give my peas one drop of water (I have my own well and am compelled to go easy on watering) but I had the biggest crop of peas I have ever grown. We harvested 82 lbs. from four twenty-five foot double rows. We ate peas about three times a week for five weeks and put 33 pints down in our freezer. The picking was a real job.

How did I do it? It was simplicity itself. Last fall, I sprinkled my garden rather lightly with ground phosphate rock and then with a mixture of compost and cow manure. The ground was left rough. This spring, I raked everything smooth and when it came time to sow peas (about March 20th) I made drills 4" deep with a hoe. I put a layer of compost all along the drills and raked it in. This left the drills about 2" deep. I inoculated the seeds with Nitrogen fixing bacteria, sowed them and covered them with an inch of soil, filling in the drill as the seeds sprouted. I left the rest to Nature and she did well by me.

(*Continued on page* 59)

Seminar on Green Matter

by WILLIAM H. EYSTER, Ph. D.

THE term, *green matter,* refers to any and all plant materials which are used in the compost heap or elsewhere as a composting constituent. Green matter may consist of leaves, weeds, grass clippings, corn stalks, sunflower stalks, hedge trimmings, seaweed, spoiled hay or straw, kitchen wastes, chaff, apple pomace, castor bean pomace, vinery wastes, gin wastes, winery wastes, sawdust, grocery store wastes, brewery wastes, garbage, or any other kind of plant material you can lay your hand on. In many cases you will find neighboring land growing in weeds. It is not difficult to get permission to get these weeds for the cutting. By cutting these weeds before they go to seed you can not only get green matter for composting but you also protect your own land from being seeded by these weeds.

Seaweed

Q. Would you consider seaweed collected along the beaches of our oceans suitable materials to be used as green matter?

A. Yes, seaweeds contain greater or lesser amounts of the salts which occur in the sea. Many of these salts are required by land plants in trace amounts. Seaweed serves a double purpose, it provides organic matter and contains many of the essential elements which have been leached out of our croplands.

Sawdust

Q. Is sawdust considered green matter in making compost?

A. Yes, because it is a compostible plant product.

Sufficiency

Q. Is there enough green matter to go around among all those who are interested in making compost?

A. The supply of green matter suitable for making compost is almost inexhaustable. The U. S. Forest Service has estimated that some twenty million tons of sawdust are produced each year by the approximately 40,000 sawmills in the United States. Then there are many millions of tons of peat which can be bacterized and composted. Also there are almost limitless amounts of such forest products as leaves, shredded bark; leaves from city streets; by-products from many industries using plant materials, as hops from breweries, corncobs from grain mills, cotton wastes from cotton mills, apple pomace from cider mills, cannery wastes, garbage, spoiled hay, wastes from pea vineries, nut shells of many kinds, water hyacinths, seaweed, wastes from grocery stores, and innumerable other plant residues available in many parts of the country. It is surprising how much green matter can be found by one who actually goes looking for compostible materials.

Swamp Plants

Q. Can such swamp plants as cattails, bur reeds, and sedges be used as green matter?

A. Yes, any and all plant materials can be used. The value of the compost increases usually as the number of kinds of plants used increases, because all the essential elements for plant growth are apt to be in such compost.

Molasses

Q. Can molasses residues be used in the compost heap?

A. Yes. Molasses is high in fermentable sugars and also contains essential elements. Yeasts in the compost heap will ferment the sugars in the molasses.

Wood Shavings

Q. May wood shavings from lumber mills be used in the compost heap?

A. Yes, but a considerable amount of time will be required for them to be decomposed. The coarser the materials are, the longer it takes them to decay, other conditions being the same.

Spanish Moss

Q. Can Spanish moss which hangs from many of the trees in our southern states be useful for making compost?

A. Yes. Spanish moss is not a real moss, but a seed plant belonging to the pineapple family of flowering plants. Spanish moss is harvested, cleaned, and sold to furniture, mattress, or upholstery people. The cleanings outside moss gins accumulate like the sawdust around a sawmill. There are hundreds of moss gins in Louisiana alone around which are more than a million pounds of moss residues. Composted moss gin wastes are now being sold under the name "Gro-Mulch".

Garden Residues

Q. Can asparagus tops be used as green matter in the compost heap?

A. Yes, and the residues of all other garden and farm plants.

Coffee Grounds

Q. Are coffee grounds considered fit material for the compost heap?

A. Yes. Coffee grounds are organic matter which have up to 2 percent nitrogen, small amounts of phosphorus, and varying amounts of potash.

Banana Stalks

Q. Have banana stalks any value for compost?

A. Yes. Banana stalks can be shredded into fine bits with a suitable machine, or may be chopped into small parts with a hand cutter of some kind. All other plant residues in grocery stores and wholesale vegetable houses are valuable. Often such plant materials can be secured at no cost.

Water Plants

Q. Can plants from streams and rivers be used in making compost?

A. Yes. Often water plants are rich in elements which are apt to have been leached out of the soil. These plants should be harvested, exposed to the sun to dry, and then used in the compost heap.

Bagasse

Q. What is bagasse, and can it be used in the compost heap?

A. Bagasse is the name of the waste plant residues from sugar cane mills. This residue is valuable for the compost heap.

Winery Wastes

Q. Do you recommend the use of residues from wineries for compost?

A. Yes. The wastes from wineries are valuable compost materials. Other important fruit wastes include apple pomace, peach and plum pits, spoiled citrus fruits, and similar residues that may become available.

Kinds of Materials

Q. I have been interested for some time in building a compost heap, but I am at a loss to find suitable green matter. Can you help me?

A. Materials for making a compost heap are not as hard to find as you may think. Recently one of our readers told us that he was hunting materials for composting and began to think it was hopeless until quite by chance he parked his car near a Giant Food Store, and noticed that each day a truck load of plant waste was being discarded. He found, upon inquiry, that it was possible for him to get this waste material without cost to himself. These grocery store wastes plus manure which he was able to get from a local riding stable, enabled him to build all the compost he could use for his garden.

Q. Are pecan leaves suitable materials for composting?

A. Pecan leaves, like those of walnut and butternut, contain tannic acid which may interfere somewhat with the normal fermentations which take place in the compost heap. Small amounts of such leaves may be used even in the fresh condition. If large amounts of such leaves are to be used, it might be better to expose them to the weather for a time before using them in the heap. If they are first shredded, the tannic acid will soon be leached out of them.

Q. Can you list kinds of green matter that might be available in different sections of the country?

A. The green matter which is available differs in different sections of the country depending upon crops grown and the kinds and nature of processing plants. Great quantities of green matter are often to be had at little or no cost, because so few people appreciate the great value and need of organic matter in the soil. A miscellaneous listing of green matter includes apple pomace, castor pomace, coffee grounds, sawdust, sandpaper dust, pecan and other nut shells, wastes from coffee roasting plants, cocoa wastes, cotton gin wastes, shredded palm tree roots, pea vines, flax wastes, beet wastes, grape residues, rice hulls, bean pods, spent hops and other brewery wastes, tomato wastes, pits of stone fruits.

Growing Green Matter

Q. Is it practical to grow plant materials for making compost?

A. Yes, for the farm; perhaps no for the garden where the space is limited. Each year a certain acreage of a farm should be used especially for the growing of green materials either to be sheet composted or to be cut and used in the compost heap. For a green matter crop, one or more legumes are recommended, as the leaves and stems of legumes break down rather rapidly, and the deep-rooted legumes bring essential nutrient elements up from the lower soil levels.

Spoiled Organic Matter

Q. Can spoiled plant and animal products be used in the compost heap? I have in mind some spoiled cheese.

A. Yes. All such materials intended for human foods which are spoiled in processing them may be used for compost. Such materials which may become available from time to time are spoiled buttermilk, spoiled butter, spoiled bread dough, bakery wastes, spoiled sugar, etc.

Pine Needles

Q. Are pine needles suitable for composting?

A. Yes. Pine needles are compostible, but will break down rather slowly as they have a rather thick outer coating of a waxy substance called cutin.

Deep-rooted Plants

Q. Can compost restore to the soil the elements which are not present in the soil in which the green matter is grown?

A. Yes, if deep-rooted plants are used. The roots of many plants penetrate the soil to a depth of many feet and absorb essential minerals which have been leached out of the surface layers of the soil. This is especially true of such trees as oaks.

Rock Powders

Q. How can the elements which have been leached out of the soil be replaced most quickly?

A. Essential elements which have been leached out of the soil can be replaced most quickly by giving it a liberal application of finely pulverized phosphate rock or pulverized potash rock. Granulated seaweed may also be used as a source of trace elements.

COLONIAL HOUSE AND GARDEN

WILLIAMSBURG, VIRGINIA

PRENTIS GARDEN

Occupied by Mr. John Prentis during many years of the 18th century this lot layout is important because of its fine arrangement of areas and the buildings within those areas. The compact grouping of house, kitchen, storehouse, smokehouse, dairy, and wellhead are outstanding. A compact kitchen work yard, a pleasure garden, kitchen garden, paddock and orchard have been provided on this half-acre lot. The pleasure garden is composed of parterres edged in box and yaupon. The board edgings, divisional railing and mixed plantings of herbs and flowers are features of an early 18th century garden.

The kitchen garden, designed in a series of squares is of sufficient size for small kitchen herbs and roots. The orchard is planted to peach and cherry.

The contrast in hedge planting of box and yaupon and its fine winter color and hardiness, is of horticultural interest.

Cercis canadensis (Eastern Redbud) is a native medium-sized tree. It is early blooming with pinkish flowers followed with pea-shaped pods persisting all winter.

Amelanchier canadensis (Shadbush) is a small tree.

Broussonetia papyrifera (Paper Mulberry) is a large tree.

Ilex vomitoria, a shrub or small tree with red berries, and commonly called yaupon.

Punica granatum (Pomegranate) is a large tropical or subtropical bush.

Modern Iris

resistant to diseases and pests

by A. F. BLOESE

THE modern iris is as much superior to the old obsolete varieties seen in almost every garden, all of which are small in size and dull in color, as the luxurious air liners of today are to the early planes which were largely constructed of cloth and wood. Many varieties are two or three times as large as old sorts.

Iris are perhaps the easiest of all perennials to grow. They increase so rapidly that in a few years even a small collection of plants will multiply sufficiently to make a colorful bed, a beautiful border around a vegetable garden, or a dividing line between your yard and that of your neighbor.

None of the named varieties are alike. They vary in size, color, texture, blooming time, number of flowers on a stalk and branching.

The superiority of compost over ordinary commercial chemical fertilizers was demonstrated by a commercial iris grower who spread several inches of compost over his land and incorporated it into the soil with a rotary tiller. The blossoms were larger and more colorful and more freely produced than those seen in an extensive iris pilgrimage which included visits to the plantings of many of the leading growers of this country. The plants were unusually vigorous, multiplied with astonishing rapidity, and the foliage was rich green without a blemish. For best results with iris use compost.

Several years ago, as we needed more room to grow iris, we moved to a farm of 140 acres. There were two large stacks of old hay and straw on the premises. A friend handed us a copy of *Organic Gardening* and after reading it we decided to make a compost heap. It was 35 x 50 feet. A foundation of six inches of straw was made, which was covered with a thin layer of sheep manure, then hay and cow manure, a liberal quantity of leaves and iris tops, and then a light application of soil and ground limestone. This process was repeated until the pile was almost six feet high. Of course, it soon packed down and settled several feet. An oscillating sprinkler, which covered the entire area evenly, was used frequently enough to keep the material from drying out. After the material had been turned several times and was thoroughly composted, it somewhat resembled loose soil. Scooping it up with a scoop on a tractor which had a hydraulic lift presented no difficulty nor was there any trouble in scattering it evenly on the field.

The compost was used liberally and thoroughly incorporated into the soil with a large rotary tiller. We planted our new expensive iris on this land. As some of these varieties cost twenty-five dollars each, the advantage of securing maximum increase is at once apparent. All the plants and flowers were truly magnificent. There was not a sign of iris borer and rhizome rot was also entirely absent. The rate of increase and the size of the rhizomes was amazing. One rhizome of Elmohr produced 22 offshoots, nearly all grew to blooming size before fall.

We do some hybridizing each year and every blooming season have some new seedlings on display. A white seedling, which we have tentatively named *Héroique,* produced blossoms which measured 9½ inches from apex to base, the largest iris we have ever seen, and we have been growing iris for more than a quarter of a century and have visited many iris gardens. Large irises frequently have the bad habit of toppling over in a heavy downpour of rain or a strong wind. The stalks of *Héroique* were so sturdy that not a single one was broken, although they were subjected to a severe gale and battered by a terrific downpour.

The best way to become convinced of the superiority of organic gardening over other methods is to try it. We have decided to grow our iris organically, which will not only enable us to send out superior plants but will enhance the beauty of the colorful display the long rows of iris in our fields make each spring.

Iris are available to suit every taste and purse, and include an infinite variety of color. We will describe a number of the finest sorts in a number of color classes which are certain to do well with a minimum of care even under adverse climatic conditions. Some of them have won

Iris zua and violas

Iris kaempferi, a Japanese iris

a place in the Iris Hall of Fame, which means that they are the world's finest.

Here they are, every one a beauty which you will be proud to grow in your garden:

YELLOWS

California Gold—Dazzling golden flowers which glow like a beacon in the garden.

Golden Treasure—A soft yellow variety, the beauty of which is enhanced by a suffusion of cream and orange.

Ming Yellow—Almost unbelievably large, clear yellow flowers, a few stalks of which make a mammoth bouquet.

WHITES

Some white iris should be included in every planting for their carrying qualities and because they are foils for dark varieties.

Autumn Frost—This excellent white not only blooms profusely in spring but sometimes also produces a fine crop of flowers in fall.

Jake—One of the finest in this class regardless of price. Named after its originator, Jacob Sass, the great iris hybridizer. Tall, stately and delightfully fragrant.

La Neige—Aptly named, because it is as pure as snow.

BLUES

Buechley Giant—Its name describes this huge rich blue.

Great Lakes—A clear blue with an aristocratic air.

Shining Waters—A graceful blue with the brightness of a summer sky.

PURPLES

Black Wings—A velvety purple-black which has the sheen of shimmering silk.

Indian Hills—A large brilliant purple which possesses just about every good quality one looks for in an iris.

Sable—The rich lustrous, almost black, velvety flowers fairly glow and attract attention even when seen at a distance.

LAVENDER PINKS

Angelus—A vigorous grower which produces a great abundance of lavender-pink blossoms with a dash of mauve.

Melanie—Large flowers generously produced on 44-inch stalks.

Pink Imperial—Perhaps the largest and tallest iris in this class. It sometimes attains a height of five feet.

PINKS

Within the last few years a goal long sought after has been attained, true pink iris. There is only one variety available at a modest price, *Flora Zenor*. It has been described as having the color of the foam on a strawberry soda. *Cherie*, which sells for eighteen dollars, is regarded as the finest pink.

REDS

There are no red iris the color of red cannas. They all are subdued by an admixture of bronze or some other more sombre color.

Christabel—Large copper-red flowers.

Rosy Wings—A rosy-red with a glistening sheen.

The Red Douglas—A rich red-purple with plush-like substance.

VARIEGATAS

Included in this class are varieties with yellow standards (upper petals) and reddish falls (lower petals). *City of Lincoln* and *Persian Prince* are both outstanding.

PLICATAS

Maid of Astalot—A large porcelain white, the standards and falls of which are edged with rich blue.

Nassak—Similar to *Maid of Astalot*, but somewhat larger.

Tiffany—A rich light yellow, daintily ruffled and edged and dotted with heliotrope.

BLENDS

A comparatively new class in which a number of colors are blended to produce novel and most pleasing effects.

Frank Adams—A flamboyant flower, in which fawn, tan and pink are blended.

Grand Canyon—Plum, copper and gold are combined and the result is a gorgeous flower with an opalescent quality impossible to describe.

Prairie Sunset—It has been described as having the hues of the setting sun.

There are still other classes of iris which we cannot name and describe because of limitations of space.

All of the varieties described are obtainable for thirty-five cents to a dollar or slightly more. Each one may be planted with full confidence that it will do well in your garden. Dollar for dollar modern iris will yield more beauty than any other flower with which we are acquainted.

TOO OLD TO GROW

by MRS. FLORENCE GUNN

I SAW, sticking its head up high above the weeds, what looked like one stem of a currant bush. I asked the tenants if there were currant bushes on the place and they said there were none. But it did look like a currant so I asked a former owner. He said that when he moved there 18 years before there had been two nice rows of currant bushes there and they did well for a year or so but soon the grass grew up around them and smothered them.

I dug out the grass at the locations he indicated that had thrifty currant bushes 18 years ago and found that a number of them had a little stem not able to get up above the grass sod. I carefully dug around every spot that had once had a currant bush and mulched the places, putting on what little manure I could spare. More than half of the old currant bushes revived. Soon I had currants for home and for sale. One year, one of these bushes was the most exquisite floral decoration I have ever seen. There was a light green flower at every place a flower was supposed to be, and the bush was lovely. One would not dream that an insignificant little green flower—when combined in such a multitude—could be so attractive. The flowers were followed by long bunches of bright red currants that covered the bush. They were almost too beautiful to eat so I let them hang there for a long time, just to enjoy their beauty. Afterwards they made wonderful currant jelly.

I laid down a stem of each bush and covered it with dirt, after having split the bark on the underside with my nail and wet the cut surface with water in which was a tiny bit of honey as a root growing medium. The next year each one of these stems had long roots, so the new plant was severed from the old and planted out.

A man who owned this farm in 1910 said that these currant bushes were old-timers when he bought the place. Since these bushes starved until they were supposed to have been dead for years made a good comeback when given a bit of attention, I am wondering if that "too old" alibi is not really "too undernourished." Maybe we need to do less grubbing out of old trees and bushes and more feeding of what we have.

It is said that the very first Concord grape vine is still alive although over a hundred years old. It has the same old roots but the top has been renewed many times. W. T. Grant, of merchandising fame, is said to have an apple tree that is nearing ninety years of age. There is a Wisteria vine in California that does not know that old age is a crime. It continues to grow and bloom and is now so large and magnificent that people come from a distance to see its beauty.

Fruits and Leaves of Currant.

Indian Compost More Productive Than Chemical Fertilizers

Indian compost manure produced from town wastes, mostly night soil, has been proved to yield greater results than chemical fertilizers.

Compost has been produced both in America and Britain, but the Indian method (called "hot" fermentation), developed by Dr. C. N. Acharya, a biochemist in the Department of Agriculture, Government of India, produces the highest quantities of manure and loses minimum carbon and nitrogen, essential for a fertilizer. Approximately 250 of 700 large Indian municipalities are now engaged in the task of producing compost manure. The total output last year was estimated to be 1,150,000 tons.

The Indian method is under study by the officials of the U. S. Department of Agriculture for its applicability to America. Under it, compost material (consisting of night soil, fallen leaves and other town wastes), is kept aerobic for a preliminary period of five to six days during which time there is rapid decomposition and rise of temperature to 65-70° C. At the end of this period, the mass is covered over with a layer of mud paste and over it earth and kept closed for about 2½ to 3 months, to allow anaerobic rotting to take place. The manure is then ready for application to land.

A number of opinions have been expressed on the higher productive capacity of compost manure. George H. Copley, in *Guild Gardener,* writes: "Never in my life have I seen more convincing evidence in favor of compost. The yield was 20 per cent higher on compost plot than that from the plot which had received many artificials. There was scarcely any cracker fruit, while on the companion plot the cracker specimens were embarrassingly numerous."

GARDEN CALENDAR for JUNE

by WILLIAM H. EYSTER, Ph. D.

THE NORTH

Flower Garden:—It is time to sow the seeds of biennials and perennials for transplanting into permanent places in the autumn. You will not want to omit sweet william, oenothera, canterbury bell, foxglove, delphinium, and lupine. Because they form deep taproots, the lupines should be seeded where they are to grow to maturity.

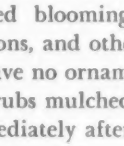
Dahlias may still be planted, but do not delay too long. Also there still is time for planting seeds of heavenly morning glories. Make succession plantings of gladiolus, babysbreath, and poppies for prolonging the flowering of these plants through most of the summer and fall. Be sure to plant everlasting flowers as strawflower and immortelle for autumn color and winter bouquets. Creeping verbenas should be given some support to keep them off the ground and free from soil stains and musting in wet weather. They should be more widely used as cutflowers.

Irises should be cut back as soon as they have finished their growth and show signs of maturity. Remove narcissus bulbs from the earth and store them in a cool, dry place for fall planting. Later in the month bulbs of snowdrop, scilla, grape hyacinth, crocus, fritillaria, and chionodoxa can be taken up and stored for fall planting. These plants are hardy and need not be taken up except for separating over-crowded conditions.

Open places in the garden should be planted with started annuals or perennials such as calendula, zinnia, petunia, china asters, calliopsis, linaria, and marigolds.

Pyrethrums should be taken up, divided, and reset so that they make a good growth before winter. Rock garden plants of all kinds may be increased from cuttings at this time. Pinch out all but the main buds of dahlia, chrysanthemums, and delphiniums if you wish large specimen blooms. Remove the poorest stalks of hollyhocks to improve growth and increase flowers of the stronger ones.

Shrubs:—The June Garden reaches its greatest triumph in the Rose, Queen of garden shrubs. Remove the fruit clusters from shrubs which have finished blooming as azalea, rhododendrons, and others in which the fruits have no ornamental value. Keep all shrubs mulched. Prune all shrubs immediately after the end of the flowering period.



THE WEST

Flower Garden:—The blooming period of the perennial border can be greatly prolonged by keeping all faded flowers removed. This can also be accomplished by being generous with your neighbors and friends, because a border from which cut flowers are taken frequently lasts longer than one from which cuttings are not made. Cut delphiniums back to the ground level just as soon as the first blooming period has ended. New stems will develop and insure you with new stems for fall blooming. Canterbury bells and phlox will react same as the delphiniums.

Chrysanthemums and dahlias may still be planted in June. Irises should be taken up, divided and reset this month. Heat-loving annuals as zinnias, salpiglossis, schizanthus, and cosmos can be planted in the garden this month. Also set out seedlings of ageratum, coreopsis, gaillardia, marigold, petunia, portulaca, tithonia, and zinnia for the fall garden. Sow seeds of such perennials as columbine, carnation, alyssum, coralbell, nierembergia, verbena, and violet. For fragrance in the garden grow jasmine and natal plum.

Move the house plants into the garden and give them positions most suitable to their natures. Some will prefer dry sunny locations, others must have some shade.

Shrubs:—Faded roses should be cut off with a sharp knife. Prune spring-flowering shrubs immediately after the blooming period is ended.

THE SOUTH

June is the month for heat-loving annuals in the South. This is particularly true of plants belonging to the composite or daisy family.

Evergreen candytufts should be divided and replanted this month. Others which will benefit from replanting are creeping phlox as divaricata, canadensis, and subulata all of which are excellent for ground cover and borders. Shade newly planted camellias. For fall color in the shrubbery, plant miniature sunflowers, tithonia, and tall ageratum. Separate and replant also Dutch irises, evergreen candytuft, and poinsettias.

Choice petunias can be propagated by layering. Do not overlook Salvia farinacea and dwarf phlox, portulaca, and gladiolus.

Shrubs:—Azalea, holly, boxwood, and other choice broad-leaved evergreens should be given liberal dressings of compost. Magnolias and mimosa are in full bloom and are a sight to behold. So also the blue-

flowered chaste trees and the white, pink, and cerise flowered crepe myrtle trees which seem to symbolize the South. Wisterias require summer pruning to keep them within bounds. Do not neglect them. Fall blooms may be had by planting now such shrubs as duranta, lantana, hibiscus, the fall-blooming cassias, clerodendron, plumbago, Daubentonia, and cestrums. Plant palms in June also.

SOUTHERN CALIFORNIA *

Flower Garden:—June is the transitional month in gardening in the warmer sections of California. The spring flowers are just passing out and immediate planting for summer and fall coloring should be rushed. Choose varieties which are heat resistant. If you have not raised your own, the nurseries are well stocked with both perennials and annuals in gallon cans and plant bands. With plenty of water down underneath and good mulching, even plants which have reached the blooming stage, can be transferred to your beds and borders. Pentstemons, salvia leucantha, salvia (blue bedder), yellow and white marguerites, hybrid arctotis, Aster Frikarte, Carnations and narrow-leaved sunflowers will furnish abundance of bloom until early winter planting season. Chrysanthemums and dahlias can still be set. Such annuals as wilt-resistant asters, cosmos, zinnias, petunias, French marigolds, African marigolds, ageratum, lobelia, Phlox Drummondi and verbenas flourish in the summer heat. Nierembergia hippomanica makes a very floriferous edging. Sown in place Tagetes signata pumila, sanvitalia, anagallis and zinnia linearis, make excellent edgings for the remainder of the season.

By the last of the month the spring bulbs can be dug, divided and replanted. They are better off in the ground with a ground cover of shallow-rooted annuals than left out of the ground until fall. In replanting, prepare the soil to the depth of eighteen inches, incorporating flour bone meal and compost. Iris, too, can be dug, divided and replanted at this time. Many of the evergreen bulbs, agapanthus, amocrinum, clivias and crinums, can be planted in permanent position from established container. Daylilies (hemerocallis) are one of our most substantial perennials which require the minimum amount of care. There are many fine new evergreen hybrids offered locally. Old Sir Michael Foster is still one of the most continuous bloomers. Biennials and perennials for early spring color to be set in September and October, can still be put in but unless you are properly equipped to raise your seedlings in shaded seed-beds watered by special sprinklers, it is better to buy your plants from your nearest nursery. Mulch liberally with compost and lawn clippings to conserve moisture. Water through mulches. Compost can be made very rapidly throughout the entire dry season by using Maye E. Bruce's Quick Method either with or without manure. This method is a boon to the average home gardener with little space.

Trees and Shrubs:—June is the ideal month for root cuttings from half-ripened wood-abelias, azaleas, camellias, cistus, daphne, escallonias, Chinese holly and many other evergreens. Such deciduous material as lilacs, philadelphus, spiraea and weigelia can be started this way. Try a

mixture of peat and Vermiculite as a rooting medium. Citrus and semi-tropicals may still be planted provided careful watering and mulching is not neglected. Well grown material established in containers may be planted throughout the summer season.

Annual blooming climbing roses like Belle of Portugal should be pruned after blooming but hybrid teas should neither be *pruned* nor *rested*. Be sure your azaleas and camellias are generously mulched with leaf mold or compost and are not allowed to dry out. *Avoid any commercial fertilizers.*

Vegetables:—Continue planting all warm weather crops: bush beans, pole beans, lima beans, soy beans, sweet corn, summer and winter squash, okra, cucumbers and melons. Yams and sweet potatoes should be rushed in. Strong plants of late tomatoes, egg plants and peppers will out-distance earlier planted ones. Mulch thoroughly with grass clippings and compost, and water through your mulch, watering thoroughly rather than often. Lettuce may be raised by using the summer varieties: Great Lakes, Slobolt, Oak Leaf and Bibb. Tampala is one of the best hot weather greens.

LOWER SOUTH **

Flower Garden:—That beautiful and popular flower, the gardenia, with its wonderful perfume, should be in full bloom early this month. To get new plants, cut slips from the lower sections, a foot or so in length, and plant in good garden soil, covering at least half of the slip with earth. Other flowers to plant this month are: gaillardia, globe amaranth, helianthus, morning glory, petunia, portulaca, salvia, tithonia, verbena, periwinkle, zinnia.

Fruits and Vegetables:—Several months ago it was suggested that figs be raised in Florida to a greater extent than they are at present. No

* Charlotte M. Hoak, 1125 Stratford Ave., So. Pasadena, California

** By Edwin H. Abrams, St. Cloud, Forida

(*Continued on page* 61)

GROW TOMATOES

Pruning and Staking

by W. ACKERMAN

WHETHER tomatoes should be given some form of support or left to spread naturally over the ground is a much argued question. Many gardeners contend that nature meant the tomato plant to grow along the ground, and therefore, any method that diverts the plant from this natural characteristic is wrong and of detriment to both plant and fruit. This argument is not necessarily true, since most of the plants we grow have been changed quite radically from their wild ancestors and are grown under environmental conditions quite domesticated in respect to the native habitat of the early forms. From personal experience in growing the plants under both systems, I have come to prefer the staked procedure. However, there are many arguments to represent each side of the issue.

How to Prune and Stake

Standard varieties of tomatoes naturally form an erect center stem, and side sprouts or branches form the axil of each leaf. The tomato normally branches at each leaf and the number of sizable branches may range from six to fifteen or more. When tomatoes are trained to grow on stakes or trellises, they are usually pruned to a central leader, although many growers prefer two and sometimes three stem systems. In pruning to a single stem, the grower pinches out the small side shoots as they appear in the axil of the leaves. When the shoots are nipped young, the growth is directed into the main shoot forming a single stemmed plant, which is kept upright by tying it to a stake or other means of support. Shoots sometimes spring from the fruit clusters and it is especially important that these shoots be removed as early as possible. It is also important, if the plants are to be pruned, that they be gone over every week or ten days while they are actively growing. Unless the gardener is prepared to do this work, it is better not to attempt this method, since more harm than good will result from a pruning job half done.

The material used to support tomato plants varies somewhat. The most common practice is a stake placed next to each plant, usually measuring from one to two inches in diameter, and anywhere from five to eight feet in height. Some growers prefer larger stakes set from ten to twelve feet apart, between which a horizontal, heavy gauge wire is stretched. Heavy cord is fastened to the wire above each plant, and the other end of the cord tied to a small stake next to the plant. The trellis system consists of stakes set in a similar manner as those described in the previous method. Chicken wire or some other type of wire fencing material is fastened to the poles and the tomato plants tied and trained to it.

When stakes are used for each plant, it is generally considered best to drive them into the soil as soon as the plants are set, although some growers delay doing so until the fruit is well set, claiming that the disturbance of staking, tying, and pruning tends to hasten the ripening of the fruit.

The plants should be tied so that the tying material is wrapped once about the stake and then looped about the plant so as to prevent slipping on the stake or choking the stem as it enlarges. Raffia, torn strips of cloth, or short pieces of any soft string can be used. The tying up will need to be repeated as the stem elongates, which it will do very rapidly.

Training to a three stem system.

Fruit Production

In the average small garden, staking is considered by many as well worth while for the simple reason that it makes possible setting out more plants and getting a bigger total yield for the soil area used. The yield per plant, however, is actually less when the plants are staked than when allowed to spread on the ground. Perhaps the principal reason for the greater yield of unstaked tomatoes is that as the plants attain size they become recumbent lying on the ground, and when a joint of a branch touches the ground, it makes roots and so begins to draw nourishment from the soil. This increased rooting better enables the production of an abundant crop than when plants are grown upright with but one supporting root system.

In staked tomatoes, pruned to a

single stem or two or three stems, the crop is limited to the fruit which forms at the third, sixth, or ninth node on the main stem. This reduces the number of fruits that a pruned plant can bear.

Pruning reduces the total leaf surface of the plant. The leaves manufacture the basic substances for themselves and for the rest of the plant. Removal of leaves reduces the resources of the plant. Experimentation has proved that the root system is reduced about in proportion to leaf reduction. This indicates rather clearly why single-stem training greatly reduces the yield per plant, and other methods give similar results in proportion to the severity of pruning.

Earliness

Other things being equal, staked plants may be expected to ripen their fruits slightly earlier than unstaked and unpruned plants. Since there are a larger number of individual plants possible for a given area, there are larger numbers of first clusters of flowers from which fruit may set. Suggestions have been presented that a relationship exists between the percentage of fruit set on exposed, as compared with that set on shaded, flowers. That exposed flowers are more apt to set fruit cannot be founded upon insect or bee pollination, since tomato flowers are self-fertile and not dependent upon outside pollinating agents.

Fruit Quality

Tomato plants that are staked and pruned yield more perfect fruits which are cleaner, generally of better size and uniformity, with smoother skin texture and better color. Anyone with blue ribbons in mind will consider these facts and grow his tomatoes accordingly. Experiments performed at the Maine Experiment Station by M. M. Clayton, E. F. Pressey and K. H. Lees showed that tomatoes from staked vines were consistently higher in Vitamin C than those fruits from unstaked plants. Studies were made of the raw and canned Vitamin C values of the John Baer and Stokesdale varieties. It was found that an important factor for the accumulation of Vitamin C in tomato fruits is exposure of the fruit to direct sunlight during the ripening period. In the home garden, exposure to the maximum amount of sunlight may be obtained by pruning as well as by staking and wide spacing of the plants.

Diseases

Growing healthy plants in soil rich in organic matter and following proper sanitation procedures do much to minimize the diseases of tomatoes. However, additional precautions in insuring good air circulation around the plants aid appreciably in the production of healthy, clean fruit. Staking tomato plants improves air circulation about the plants and fruits, and for this reason greatly reduces the severity of many of the fungus blights and diseases.

Staked and pruned plants are not as susceptible to foliage diseases. Experimental tests indicate that such plants are also less affected by tomato blight and many of the fruit rots. The staked plants are almost immune from injury by snails and wire worms; insects are more readily controlled. Cracked fruit appears in damp weather, or when it is left too long. Frequent picking helps; staking is also said to help.

Probably one of the more important disadvantages of staked tomatoes is that there may be more blossom-end rot unless watering can be done during dry periods. Mulching is especially desirable with staked plants for this reason, since it conserves moisture and lessens the danger of hard packing of the surface between the rows from repeated treading of soil in pruning, tying and picking the fruits.

SHOOTS SHOULD BE REMOVED THAT ARISE FROM THE FRUIT CLUSTERS
REMOVE SIDE SHOOTS AS THEY APPEAR IN THE AXIL OF THE LEAVES
SINGLE STEM PRUNING

For lawns and for seedlings and small plants, the compost should be screened. The coarse materials may be used for mulching or be put back in a new compost heap as green matter.

Two Years' Observation of Organic Gardening

by CATHERINE W. SCUDDER

WHEN I went to Wisconsin in 1944 I found my sister struggling with a suburban lot which had been filled in with subsoil. The garden was divided in three parts, a lawn bordered with flower beds, a vegetable garden with raspberries, grapes, and rhubarb, and an herb garden. Spading in any part of it revealed a sticky, yellow subsoil. I suggested that we try Organic Gardening and we spent the summer hoarding green material. We tried to include some of the plants mentioned in the manuals on compost heaps as beneficial to bacterial action, and used chamomile from the flower garden, chicory from nearby fields, yarrow from the herb garden and dandelions from the lawn. Together with kitchen waste, leaves, and weeds from both gardens, we had a sizable heap and started building two compost heaps each about 7 by 8 ft. and 5 ft. high, on September 1st. We made layers of green material, then strawy manure from a nearby packing plant, and earth and lime according to the prescribed formula. One heap was turned once, then owing to the labor involved we decided to let Nature and the earthworms take over. Holes were made with a broom handle and these were filled with water occasionally and in dry weather the entire heap was given a thorough soaking. The Wisconsin winter put an end to our labors in December.

The following April the heaps seemed to be pretty well broken down into fine black soil. A good share of it was spaded into the vegetable garden, leaving a six inch layer on top. The remainder was divided between the flower beds and the fruit garden of red raspberries, grapes, and rhubarb, with a portion reserved for potting and the cold frame. We planted carrots, beets, onions, turnips, kale, spinach, squash, bush and pole beans, cucumbers and green peppers, tomatoes, sweet basil, parsley, and lettuce in a muslin-covered frame.

The cucumber patch 9 by 15 ft. planted with hybrid and Minca varieties, yielded beyond our fondest expectations. The vines planted in May under hot Kaps remained green and healthy until frost. They made a dense growth on the ground, then wandered over to climb the grape arbor where long green cucumbers hung among the purple grapes. There were no pests and no diseases. In a year of tomato blight our plants had no blight and produced ample tomatoes for the table and to can. Our Simpson lettuce under its muslin cover was of fine flavor and crispness until August. The rhubarb,

which had drooped the year before, produced mammoth stacks of wonderful flavor, entirely different from the acid product of the preceding year. All of the vegetables were of superior flavor and size.

The flower garden was a thing of beauty all summer, with a marked change in the size of the flowers.

Except for the initial spading of the garden and turning our compost heap we had no outside help. One noticeable effect is the diminution of weeds. The six-inch layers of weed-free compost effectively smothered most of the weeds. It was late summer before the usual amount of weeds appeared. One does not need to dwell on the advantage of this in gardening.

House plants thrive in compost. My sister raised beautiful African Violets in pure compost. Clivia started from seed and flourished. A cutting from a discarded hydrangea was placed in a pot of rose geranium. In ten days a strong green shoot appeared at the base of the cutting. We were skeptical as to its origin. However, it was the hydrangea and now it is a lusty plant due to bloom.

Moving to North Carolina last year, we saw red soil deficient in organic matter. But one elderly neighbor is a delight and a wonder to the city-tired. His small acreage is a good example of Nature's balanced scheme. Living alone with his garden, his bees and his cow, he is largely self-sustaining. Giant White oaks guard a bubbling spring which cools his milk and butter. Mocking birds sail in and out of the fig trees and the Muscadine grape vines, which are heavy with their leathery-skinned luscious fruit. Old box bushes shelter the tiny songsters. His bees perform their dual duty of fertilization and gathering honey, and the cow and garden supplement each other. Scorning artificial fertilizers and poison sprays (for he has no need of them), he has achieved a balance and his erect carriage and perfect health testify to the merits of natural living.

Removing Blossoms

There is a definite knack to the proper removal of Rhododendron blossoms as they fade. They should be snapped to have good bloom next year. But *just* the bloom cluster. Remove too much and there'll be no flowers the next season.

—o—

Better Portulacas

Crowding and moisture are portulacas pet hates. Thin seedlings to a foot apart, and you'll not only have healthier plants, but much better bloom.

—o—

Poinsettia Cuttings

Poinsettia's can be propagated by cutting four inch pieces of new growth and inserting them in pots of warm, moist sand. A drinking glass inverted over each one speeds up rooting, since greenhouse conditions are thus almost provided. When roots are formed, transfer to three or five inch pots.

—o—

Dividing Iris

Bearded Iris should be dug and divided in June or July about every third year, and the strongest rhizomes replanted.

—o—

Pressed Flowers

For bright looking pressed flowers, dry them rapidly in a hot, dry place, and change the blotters several times a day.

—o—

Faded Blooms

Cutting the faded blooms from perennials saves their strength for more bloom instead of extending it in an effort to set unwanted seeds.

Ants and Peonies

There is no evidence that ants, which are so common on peonies in the spring, do any damage to plants or flowers—unless they happen to make a nest among the roots.

—o—

Plant Support

Twiggy shoots of woody plants are invaluable for supporting herbaceous plants which are many-stemmed in habit. The twigs should be thrust into the ground about the plant to be supported before it has attained its full growth. As it grows, it will tend to lean outward, and will almost completely hide the supports.

—o—

Camellia Pruning

In pruning small camellias all they need is some topping back or removal of weak growth to keep them in shape. When the plant grows larger, blooms may be picked with longer stems, and this, when done wisely, takes care of the pruning with no harm to the camellias.

—o—

Wild Flower Corner

The wild flower garden should have slightly acid soil and be mulched with needles from beneath your evergreens and last year's oak leaves. This mulching, if done early in summer, helps get the flowers ready for next year's bloom.

—o—

Fresh Cut Flowers

To double the life of fresh flowers, cut their stems at a long slant. They'll absorb more water and stay fresh longer.

Another authority recommends adding a lump of sugar or camphor to the water to keep cut flowers fresh.

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Soil Acidity Test

A simple test of soil is to place a tablespoonful of soil in a glassful of water, and a teaspoonful of weak ammonia. If, after standing several hours, the liquid becomes dark-brown, or black, it is an indication of soil acidity.

—o—

Potatoes

Too much nitrogen in the soil will cause potato plants to grow an excessive amount of foliage.

—o—

Moisture Retention

In hot weather, seed rows may be covered with narrow boards or burlap to keep them moist and prevent a hard crust from forming.

—o—

For Vertical Corn

Hilling up around corn will help keep the plants from falling over in sudden windstorms.

—o—

Supporting Cucumbers

Cucumbers, in case you do not already know it, can be grown on trellis or other supports, and so can vining-type squashes, for that matter. Where garden space is at a premium this is a good ground saver.

—o—

Brussels Sprouts

When the small sprouts begin to appear on Brussels sprouts, cut the large leaves off along the stalk to favor the development of the sprouts.

—o—

Exceptions

Eggplants and onions are among the few plants that do not appreciably benefit from mulches. They seem to flourish in hot, dry soil.

—o—

When To Pick Sweet Corn

Sweet corn should be picked for table use when the kernels exude a creamy milk when punctured.

Muskmelon Loss

Muskmelons on the plant may turn yellow at the stem, dry up, and fall off. This is due to the vine setting more fruit than it can mature. It also may be due to loss of moisture in the soil, or sudden temperature changes. Early mulching around the young plants will help to prevent the latter cause of drying up.

—o—

Mulch

Now is the time to mulch the vegetable garden to conserve moisture and keep down weeds.

—o—

Beet Seeds

Beet seeds require considerable moisture to germinate. "Beet seeds" are really fruit clusters with hard shells, each cluster containing two or three small seeds. The husks, or fruit, are relatively impervious to water. Therefore, if sown late in the season, care should be taken to have a moist seed-bed. Since beets come up in little clumps, careful thinning of beets is essential.

—o—

Scare-Away

I have 3,000 square feet of strawberries, half of which went to the birds, until last year, I hung up 50c worth of scare-aways and didn't lose a pint of berries all season. I also used them with great success in my raspberries and in sweet cherry trees.

This article was first used on the west coast in 1948. This year, they are in Burpee's catalogue among others. There are now two distributors in the Detroit area, which should insure a good supply to seed stores.

—o—

Rhubarb Flowering

Keep blossom stalks of rhubarb cut back as flowers, and seeds exhaust the plant.

New Organic Method

(*Continued from page* 16)

some of the finished material is placed back again at the top to inoculate the mass with the proper organisms.

When we began to make compost in open pits as against the older method of merely piling the material in heaps I noticed that it made a higher quality compost at the sides of the pit as compared to the compost at the sides of an open compost heap. This must be seen to be appreciated. At the side of the pit, where the conditions are more anaerobic, the quality is better. In an open compost heap the nearer you get to the bottom and to the interior where air cannot penetrate too freely, the finer compost you get.

I also wish to state here that the compost which is being made today commercially in large digesters, with inoculation of bacteria, such as the Frazer compost has the two advantages above enumerated. For one, rain water is not permitted to enter. Nothing can leach out from the bottom. Secondly, there is not a violent oxidation with excess losses of nutrients.

In connection with making compost by the open method it was necessary to layer the materials with earth. This was one of the great drawbacks to the farmer. Where were they to get such large amounts of top-soil. They hesitated to take it out of their own fields. In the Selvi method no earth is required.

Now we come to the problem of the gardener. For all practical purposes he need not bother at all with the Selvi method. But neither should he go back to the old method. Here is my advice to the gardener. As much as possible take the materials which you would ordinarily use in making compost and apply it as a mulch well mixed up in your flower and vegetable beds. Be careful not to dig it in during the growing season. At the end of the season it is best to cover it with more mulch raw materials, but don't dig in the older stuff. Keep all soil covered thoroughly over the winter.

Now there will be *some* compost making. For example there will be garbage to dispose of and this we do not advise applying as a mulch. Here in my opinion is the best way of making compost for the gardener. Use the earthworm breeding method and use your garbage mixed with grass clippings, leaves and a little soil. It can be done indoors and out, in boxes, pits and heaps and is a good way of making compost over the winter. The earthworms will saturate it with their wonderful castings. There is no leaching from below and the working earthworms prevent a high-heat oxidation. Biologically, this is the best kind of compost there is. You can get more information from our booklets. You can get a wealth of information on the earthworm in the following booklets which can be purchased from the Rodale Press:

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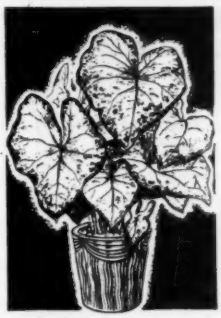

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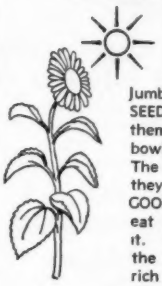

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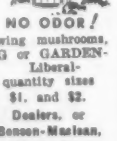

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Della Devil's Horse — Praying Mantis

(*Continued from page* 17)

sized appetites. They soon changed to a soft green color, but the eyes, "hands" and appetites didn't change, except in size. They roomed in the poinsettia plant that lice were about to kill, and while they licked them up in myriads, they always had room for tid-bits such as house flies, cockroaches, mosquitoes and other problem insects.

Soon, Della had grown to about three and one-half plump inches and would hide behind a leaf and wait to be called. Then, poking her long face out, she would graciously accept any little morsel of hamburger meat, bug or fly from the donor's hand. After eating it, Della always carefully cleaned the saw-like teeth in her forelegs, or hands as they seem, then licked them and washed her face much as a cat does.

With the coming of the first signs of fall, Della's only romance blossomed. It was a short mating time, and as the picture shows, they did not live happily ever afterwards! Pious and modest as she appeared to the slender male gallant at first meeting, she led him on to an ardent mating, then sprang upon his slight form and tore off his *surprised* head with cannibalistic intent. Yes, she ate his head and threw his quivering body contemptuously on the ground. Apparently tormented by the sight of his thrashing headless body, she jumped down and tore off his legs in a fury. She is *all* praying mantis, however, in the pious pose assumed immediately afterwards.

Della's next act was to lay her eggs, and that completed her life's cycle. Her lovely green color changed to a dull brown, she had no appetite, grew thin and wan, and lived only a short time. She had fulfilled her destiny in every respect, and that is more than can be said of most humans.

Choosing Your Tree

(*Continued from page* 21)

size of a pea and merged in a leaf-like wing that is shaped something like the feathers on a badminton ball and has the same effect. The seed will sail along on the wind and finally parachute gently down. The American linden differs but little from the European linden, *Tilia Europaea,* which also is familiar as a shade tree in this country. The European tree is smaller and its leaves are smaller and taper to a narrower top. The wood of these trees is soft, straight-grained, light brown and is easily worked. It is used to manufacture almost any furniture and once was used extensively for carriages. It still is used for wood carving and pulp. Its tough inner bark, the best, often is shredded to use in mats, or, like raffia, in budding roses. The wood weighs 28 pounds per cubic foot. The flower of this tree is so sweet in spring that it is an important source of honey for bees. Perfume also is manufactured from it.

The southern type of linden generally is known as basswood and seldom grows to be 60 feet tall. It appears along the swamps and streams from Long Island to North Carolina and occurs even in Florida and Texas. One variety likes limestone soil and stays in the mountains even in Florida and Alabama. It is a good commercial tree and its wood weighs 26 pounds to the cubic foot. Among lindens there is one variety that has upright branches. This is the *Tilia platyphyllos,* variety *pyramidalis,* a European tree not seen much in this country, but a beautiful ornamental tree. Its branches taper from a broad base to a pointed apex and the tree can be trimmed to perfect symmetry.

The linden, in general, is one of the most popular trees. In New England and the Middle Atlantic states the European type is most often seen while in the middle west the American linden generally is found. This tree also is among the pretty fall trees. Its leaves change their coloring through green and yellow to rust.

Since everyone wonders at some time or other just what it is that makes leaves change color let us look at them before closing. As winter approaches and plant or tree leaves cease to function as food factories, the food then is conveyed back to the branches or stems and there is stored away in the form of starch for the spring. This causes the leaves to be no more than empty machines or frameworks of cells containing waste materials.

But while the food is being taken from the leaf another process is going on. A chemical substance, known by the unhandy technical name of anthocyanin, is produced. In chemistry such a substance is known as an indicator because in the presence of free acid it turns red. It is blue when no acids are present and a little acid gives it a purple tinge. The green coloring matter, chlorophyl, also takes on a yellowish appearance at this time due to the green pigments having been removed. Thus the combination of anthocyanin and the yellowing carotinoids causes the orange color of leaves, as well as all the other colors. The greatest rainbow of colors is present in the leaves when there are nearby evergreens which carry the acid to make the color change. However, not all trees present the reds, oranges and russets. As we have remarked, the linden has pretty combinations of yellow and green. Others in this class include the walnut, elm, hickory, horse-chestnut and white birch. But to see all the colors of autumn one must hunt the oaks, the maples, the sassafras and the sumacs. These have variegated tints from purple, through crimson to scarlet, orange and yellow and should be remembered as among nature's best decorators.

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Deficiencies

(*Continued from page 25*)

Messrs. McMurtrey and Robinson recognize the necessity of adding trace elements to the soil, but make no suggestions other than adding manure. Since manure is not readily available to the great majority of farmers and gardeners, another source must be found. These gentlemen say, "The problem of the addition of secondary elements to commercial fertilizers is a complicated one and must be conservatively handled. The compatibility of carriers of secondary elements with other ingredients of the fertilizer mixture is to be considered. It will frequently be difficult to obtain a uniform mixture of the small amounts required. In many cases the chemical reaction of the clay or absorption complex, as well as the question of economy, will be a determining factor. Thus, the addition of a pure manganese salt to a clay saturated with calcium will very soon result in the precipitation of insoluble manganese dioxide. A similar reversion to an insoluble form apparently occurs with zinc. Molybdenum and copper and other elements with similar properties have relatively insoluble sulphides..... Some of the secondary elements have very narrow ranges of concentration in which they are of use to plants. Boron is one of these. For many plants in water-solution cultures a few parts of boron per million are absolutely necessary for plant growth, while 20 or more parts per million are fatal to many plants...."

Since modern machinery makes it possible to reduce rocks to such fine particles that they are practically colloidal in size, the addition of rock powders to the soil is a satisfactory and economical method of remineralizing soils. For instance, Rhum phosphate rock and glauconite contain a relatively large number of trace elements in addition to the major and minor elements. Rock powders rather than sand or other inert materials should be used as fillers to dilute the major and minor elements as nitrogen, phosphorus, potassium, magnesium, sulphur, and iron. Whether powdered rocks be added to the soil directly or incorporated in fertilizers, it is important to remember that the soil must always contain a sufficient amount of humus to make the elements in these powdered rocks available.

Susceptibility of plants to certain fungi and insects must be regarded as a deficiency of one or more essential elements. In controlling diseases and insects, prevention by adding the deficient elements to the soil is by far the more natural and more economical measure to be taken.

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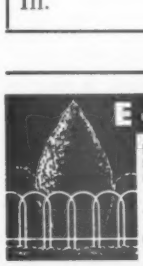
***Clarification* . . . .**

We wish to clarify an item which appeared in the February, 1950 issue: On page 58, we reprinted a paragraph from an article in the *Christian Science Monitor,* by Herbert B. Nichols, entitled "Normal Soil Better than Abnormal Biocides." We inadvertently neglected to state that Mr. Nichols was referring to the method of normalizing soil as suggested by Mr. and Mrs. J. David Larson, agricultural chemists of Hinsdale, Ill.



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Water Hyacinths

(*Continued from page 28*)

with arsenic. The net result of this operation was a few sickly hyacinths and 300 dead cows.

It wasn't until about 1917 that anything remotely practical was found to remove hyacinths. This rig was a sort of endless chain conveyor which gathered up the weeds and tossed them out on the bank. The removal cost per acre with this apparatus, however, was about $300, and the lasting benefits negligible. Some modification of the conveyor, though, continued to be about the only effective control instrument until a few years ago when a giant underwater saw was thrown into use. Because of the cost involved none of these methods were practical except as temporary relief measures.

Today, however, waterway engineers have what they believe is the answer to the eradication of hyacinths. During the war a group of scientists whipped up a powerful chemical plant killer which they gave the tongue-twisting label 2-4 Dichlorophenoloxyacetic acid. The concoction, a powerful organic acid, was reportedly designed to spray on Japanese crops in case the Nips proved unduly troublesome. It failed to see wartime action, however, and with the cessation of hostilities was directed toward the more prosaic task of killing weeds. In 1946 Dr. R. V. Allison of the Everglades Experiment Station began toying with 2-4-D as a weapon to fight hyacinths. At first he thought his experiment was a failure because of the slow action of the chemical. However, the more it was used the more obvious its effects became.

2-4-D is a hormone agent that stimulates plant tissues to such an extent they simply burn themselves out. Very small concentrations are needed. The different brands of 2-4-D vary in strength, but on an average one quart mixed with 100 gallons of water will make a very effective spray. The chemical works with deceptive slowness. Generally it is from 5 to 11 weeks from the time of application before the hyacinths finally give up the ghost and sink. Many local groups, though, made the mistake of spraying only once. *Remember, no single application of 2-4-D will kill hyacinths!* The plants grow in step-ladder succession. First there is the parent, then under it is a series of smaller plants. The initial spraying will take care of the cover plants, but it usually takes two more to completely wipe out the smaller ones.

There are several modes of distributing 2-4-D, ranging from back-pack sprays to airplanes. For small pools, ponds and shorelines, the back-pack sprayer is most practical and most economical. For larger areas and heavy concentrations a boat equipped with a power spray is most suitable. On particularly large lakes and streams application from airplanes works very well. The material cost of spraying with 2-4-D amounts to only about $1.60 per acre. The operation cost varies according to type equipment used. The capital investment to set up a boat and power spray rig runs about $300. Two men using such an outfit can cover about eight acres a day. Total costs for the three applications needed to completely eradicate hyacinths generally runs between $11 and $13 an acre—a far cry from the $300 to $600 an acre spent for clearing streams a few years ago.

Yes, 2-4-D is a part of the answer to the hyacinth problem, but only a part. The remainder of the solution will come with an aroused public that recognizes the water hyacinth for what it is—a spreading cancer on the waters of Florida.

Editor's Note—Succeeding articles in this series will point out the values of the water hyacinths as a soil builder and remineralizer.

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Greenhouse

(*Continued from page 33*)

you do in a greenhouse is to raise plants for setting out in your summer garden. You can grow them by the thousands in a home greenhouse. Husky plants for tomatoes, cabbage, cauliflower, lettuce, melons, broccoli, celery and peppers, as well as all of the bedding plants for your flower garden. Seed is inexpensive and the plants you grow yourself are much finer than those you can buy. What's more, you can have them in the particular varieties you choose because you can always get the seed of the strains you want from the catalogs, but can seldom find the exact plants on the market.

While it costs almost twice as much to bring the home greenhouse up to moderate or warm temperatures in comparison with a cool house, many exciting plants can be grown that make it well worth while for those who like the unusual. Orchids are among them. With a collection of 50 to 75 plants of different varieties, it is possible to have something in bloom every day of the year. Some of them last a very long time. Cymbidiums will keep for as long as three months. Any orchidist will tell you the plants are not difficult to grow. In fact, they will stand more abuse than most of the annuals previously mentioned. Insects are not a serious problem. Orchids can be grown in any greenhouse where it is possible to maintain an even temperature and keep the atmosphere fresh and healthy. High humidity is essential and this is usually provided by placing a tray of coke underneath slat plant benches. This coke holds tremendous quantities of moisture and gives it off slowly.

Other flowers and plants that do well in the moderate to warm greenhouse include: amaryllis, azaleas, begonias, ferns and tropical foliage plants, bougainvillea, cactus, gardenias, gloxinias, poinsettias, potted roses, Saintpaulia, and lantana. Those who enjoy growing unusual things that bring visitors into the greenhouse with exclamations of "ah" will include such plants as *Tacca chantrieri*, the devil plant whose curious blooms have long drooping whiskers and which is seldom out of flower; *Columnea gloriosa* with its fleshy leaves on long trailing stems that make it excellent for hanging baskets; and *Rondeletia odorata* that blooms more or less continually with bright coral red flowers.

Perhaps the most satisfying thing about greenhouse gardening is the great therapeutical value and contentment it gives to so many people, young and old. In a Veteran's Hospital, a wounded soldier became so preoccupied with gardening that he was suddenly discovered to be using a hand that had been hurt in service which it was thought he would never have the use of again. A woman in Arkansas was told by her physician that no medicine would ever cure her illness. Now she is having the time of her life with her hands elbow deep in the soil of her greenhouse. She is well, hale and past 40. A man from Toledo once told me that after building a greenhouse for his 79-year-old mother, her activities and frame of mind became that of a woman 10 years younger. A woman from Virginia says she finds nothing so relaxing to keep her mind off aggravating world affairs than her greenhouse. There is a something about gardening in the winter sunshine. . . . Almost suddenly, taut nerves loosen and you capture the exhilaration that goes with living close to nature.

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Sheet Composting

(*Continued from page* 37)

rich "old-time" soils, compost must be very heavily applied. Another criticism is that the organic method is merely a rallying point for cranks and faddists who would generalize on a farm scale from backyard experiments: amateurs who would tell the experienced farmer how to run his business. Others are suspicious because the organic method has nothing to sell—nothing save the future health of future generations, that is! Modern propaganda has made us indifferent even to our own fate, so how can the exponents of the organic method expect to arouse any interest in *future* health problems? The water shortage in New York City, the public indifference towards it, the stupid utterances of "public officials" about its causes and cures, will do more to point up the basic principles inherent in organic soils than any amount of editorial proselytizing that can be done. The engineer who remarked that the ideal watershed is a concrete apron, has no concept of how water is stored in organic material in the soil and then gradually released by nature to prevent just such a shortage as New York is now enjoying.

Sheet or field composting will do much to overcome the objections to the organic method I mentioned above. It will cut down on the labor of composting, allow organic material to be handled without special farm machinery, and will cause vast areas to hold more water, both at run-off time and during the drier seasons. But most important, it will prove that the belittled backyard gardener is right in principle. Non-organic farmers who would never consider the compost pile formerly advocated can be much more easily persuaded to try sheet composting. It will be increasingly interesting to follow the experiences of others who have changed their methods of composting.

I don't believe that

(*Continued from page* 39)

I believe my peas withstood the drought so well because the compost in the soil held a lot of moisture. I believe, too, that my plants root deep because there is nothing to tempt them to feed on the surface, as there is when a "side dressing" of commercial fertilizer is used along the row; finally, I think my plants are sturdier than chemically fed plants and so can stand adverse conditions better. Anyway, whatever the explanation, I had a fine crop of peas although, according to the rules of the game, my vines should have been burned up by the drought.

Organic Gardening Clubs

The Organic Gardening Clubs, which have been organized in many places, are performing a great service to their members and to the organic movement. More films and lecture helps are needed to make the meetings even more interesting. To meet these needs, it has been suggested by a number of the clubs that each club donate $10 or more and that the Editorial Staff assume the responsibility for making the films available to the clubs at no cost except the mailing charges for the films. If your club will cooperate in making lecture materials available, send your donation to Organic Gardening, Emmaus, Pa.

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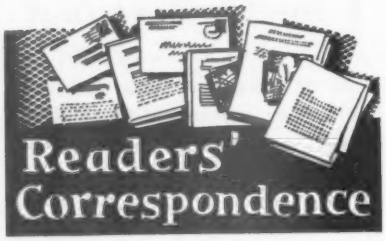

New Method

Q. According to the new method, shall I entirely discontinue to make compost?

A. No. If you have garbage you will not want to strew that around as a mulch and you can make compost of it. The best way is to mix your garbage with soil, using about 10% soil, and do not pile it higher than two feet, covering the sides and top with topsoil. Then place in it a large quantity of the domestic type of earthworms, who will break it down in a few months. Keep it well watered. The same thing could be done with manure. There are situations where it may be desirable to make compost, but I suggest working away from the old method. For best results a pit with a cement bottom sloping towards a small drainage pit with a two-foot-high side wall is best.

Weeds

Q. If you make compost by the enclosed method where there is no high heating and it does not kill the weed seeds, what are you going to do about them?

A. The best answer is to mulch your plants. This will not only keep the weeds down but will keep the soil moist and prevent the sun from baking it.

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Acidity

Q. I am interested in utilizing a plot of ground. How can I determine if the soil is good or if it lacks certain elements or is too acid?

Mrs. L. C. G., Pittsburgh, Pa.

A. A great deal can be learned concerning the fitness of soil for growing plants by observing what weeds grow in it. An abundant growth of sheep sorrel (*Rumex acetocella*) indicates that the soil is extremely acid; nettle, violets, various sedges indicate a more or less neutral soil; while rough bedstraw (*Galium aparine*), clover, sweet clover, fall dandelion, and plantain (*Plantago media*) indicates an alkaline soil. Soil reaction can also be tested with litmus paper, or by using the well known indicators, sometimes advertised in this magazine.

Moss on the soil indicates either poor drainage, acidity, or deficiency of certain elements. A good rule to follow is that where weeds grow, vegetables and other crop plants will also grow.

Garden Calendar

(*Continued from page* 47)

varieties were mentioned at that time, but for those who want to start this wholesome fruit the additional information here given may be useful. Figs have a wide range and there are suitable varieties for all sections of the State. For northern, central and southern sections Celeste and Green are favorites. Brown Turkey, Ischia and Brunswick are among others suitable for Florida. They should have a heavy mulch to protect the roots. A foot thick would not be too much. Some recommend planting near a building, so that the roots can run under it. This method has the disadvantage of making it unhandy to fertilize the trees. If a heavy mulch is used, it can be easily raked off when fertilizing is needed, and with compost for fertilizer, mulch for protection from the sun, it will seldom be necessary to disturb the covering. As this is broken down and absorbed, additional mulch should be applied. One of the larger sized figs that has become popular of late is the New Delta. Vegetables to plant this month are: collard, mustard, eggplant, pepper, okra, rutabaga, spinach, turnip.

Shrubs and Trees:—The papaya, which does well in central and southern Florida, apparently has an interesting future for those who will devote their time and energy to solving the problems connected with raising and shipping the fruit. It is one of those fruits that need to be fully ripe when eaten, and should stay on the tree until nearly so. As it is a soft fruit, including the thin skin, shipping is a problem. Mention was made some months ago of a variety that had been developed in the neighborhood of Miami and had good shipping qualities. So far it has not been possible to check up personally on the eating quality of this variety. The originator is not now at his address in Florida, but it is hoped that information may be obtained soon from another source. This should be a money-making crop for those in the sections adapted to its growth.

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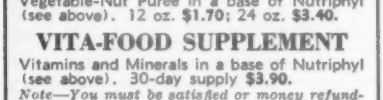

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Don't miss the first issue of this new monthly magazine, published under the editorship of J. I. Rodale. It is a new departure in magazine publishing. The entire issue will be devoted to ways of preventing

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Infantile paralysis, which has been alarmingly on the increase, frequently attacks adults. Did you know there is evidence that diet may be a factor in its causation?

The June issue of **PREVENTION** contains ten articles by and about physicians and their polio theories, including one specially prepared by the National Foundation for Infantile Paralysis. It is typical of the hundreds of valuable hints that will appear in this unique publication, all selected and developed for their value in making our lives longer and healthier. **PREVENTION** is dedicated solely to the conservation of human health, stressing not the cure of disease but its prevention.

The new Rodale magazine will be conducted on the highest ethical and humanitarian plane. Except for organically produced food, **PREVENTION** will contain no advertising. The editors will be free to comment on products they consider worthy of mention.

How PREVENTION Started

J. I. Rodale's first interest, which was in the field of general health, has long been reflected in the pages of Organic Gardening. Thousands of subscribers have shown extreme interest in health matters, and are continually writing us for health information. As it has been impossible to do full justice to this subject in a gardening magazine, we felt we could perform the job far more thoroughly by starting a new publication, the material for which will be written by experts.

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Organic Food Division
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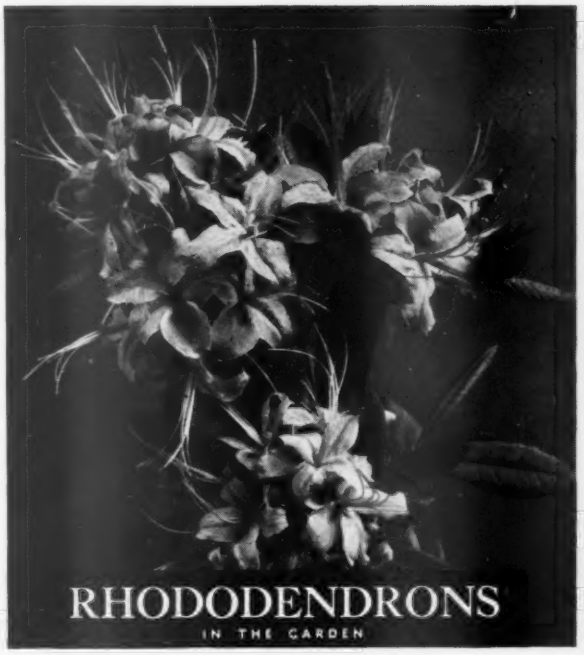

Azalea Calendulacea

Above—Naturalized planting
Above left—A flower cluster

Imitate Natural Conditions

Success in growing rhododendrons in the garden depends upon fitting them into conditions suited to their needs, or making the conditions suitable to them. When this has been done, their culture is easy; fail to do this, and failure is inevitable.

Rhododendrons require a distinctly acid soil (pH 4.5 to pH 5-6). In planting them in the garden, dig a hole far too large for the root system of the plant and fill it with well-decayed hemlock logs, wood and leaf humus, and soil from the pla[illegible] native habitat. The hole should be at least two te[illegible]eep and three or more feet wide. Native varieties need no special care, but cultivated forms should be given such locations in your garden as will give them the most nearly optimum environmental conditions. The deciduous rhododendrons are commonly called azaleas.

Azalea Arborescens

Azalea Indica

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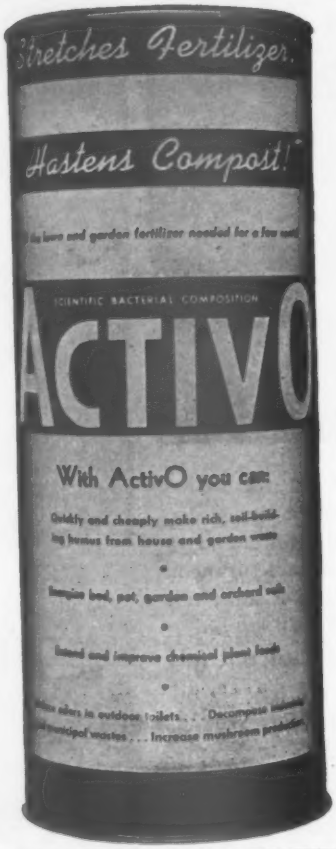

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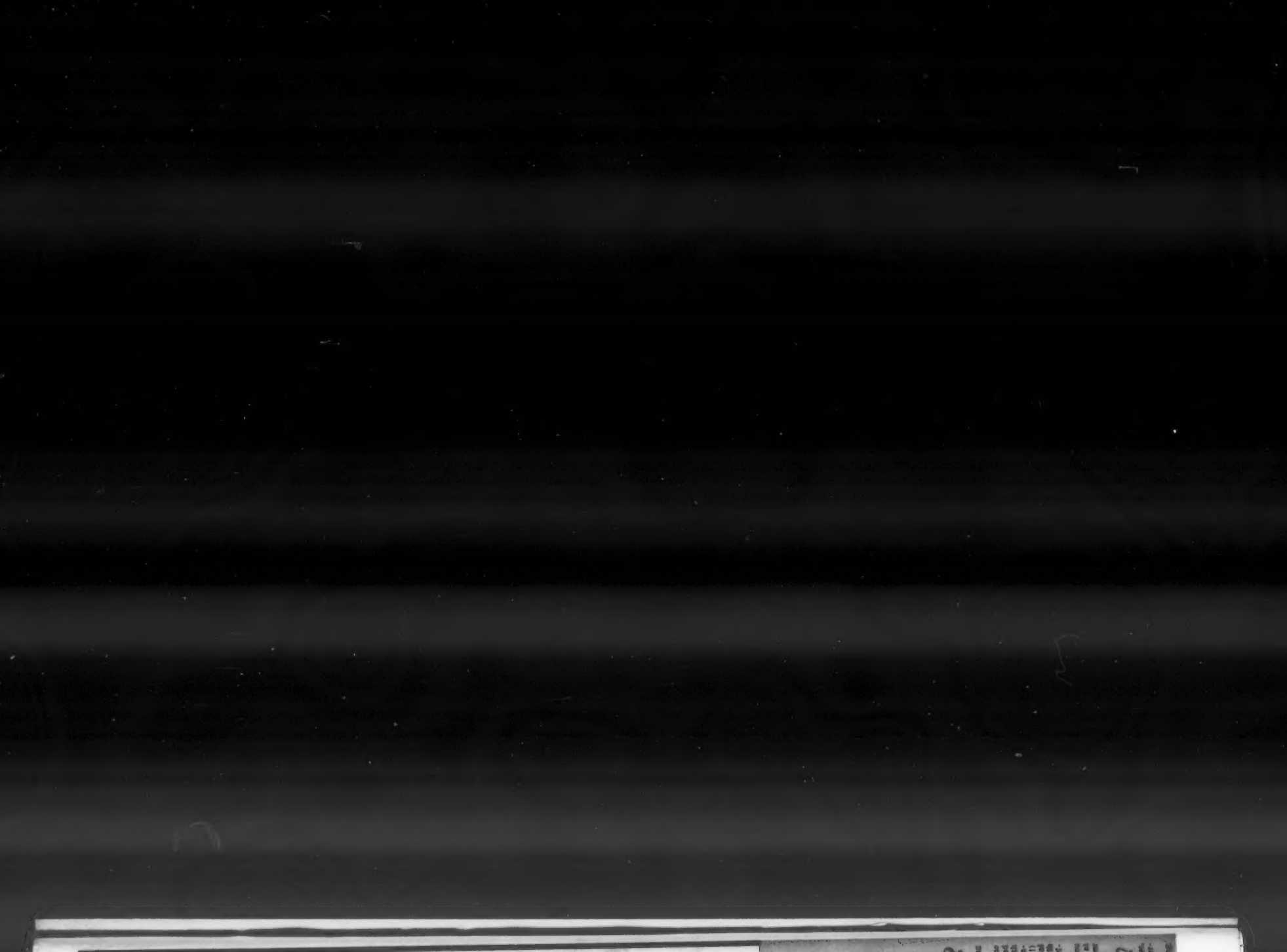
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